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SESSIONAL PAPERS.

VOLUME XVII.—PART VII.

SECOND SESSION OF THE FIFTH LEGISLATURE

OF THE

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SESSION 1885.

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No. 18... Return shewing:—(1) The amount voted by this House for expenditure on each particular Colonization Road in the Province during the year 1883, with the conditions (if any) attached to such grant. (2) The amount actually expended on each of such roads, with the dates when the work thereon was commenced and completed. (3) The roads upon which the $20,000, placed at the disposal of the Government for "Short New Roads and Repairs," has been expended, with copy of report recommending such expenditure or other application therefor, date of appropriation, dates of commencement and completion of the same, and conditions (if any) attached to such grant. (*Printed.*)

No. 19.. Reports of the Inspector of Division Courts for the years 1883 and 1884. (*Printed.*)

No. 20.. Return of copies of all Orders in Council for the sale or disposal of timber or timber berths or lands in the Thunder Bay District, or regulating the sale or disposal thereof, and of copies of all Orders in Council fixing the dues or fees to be paid in respect of such timber, and the bonus or purchase money to be paid for such timber lands or berths, or the right to cut the timber therefrom, and also of copies of all Orders in Council or regulations relating to such lands; the timber thereon, and the rate of bonus or dues to be paid in respect thereof, and also for a map or sketch shewing the area of the said district. (*Printed.*)

No. 21.. Return shewing the name of the Caretaker, Wood Ranger, or other officer of the Government (if any) in charge of the Crown Lands and timber at Rondeau Point; the salary or other remuneration (if any) paid such officer, and the amount collected by such officer (if any) for timber or ornamental trees sold, to the 31st December, 1883. (*Not printed.*)

No. 22.. Return shewing in detail the timber lots or berths in the Thunder Bay Districts which have been sold or disposed of, with the names of the persons to whom the same have been sold or disposed of; the area of each such lot or berth; the price paid therefor; the rates of dues to be paid in respect of the timber to be cut therefrom, and the names of the present owners of such lots or berths, and shewing also which (if any) of the lots upon which such rights to cut timber have been granted have been sold, and, if so, to whom, and the present owners of such lots, so far as the information is in the possession of the Department. (*Printed.*)

No. 23.. Return shewing the total number of School Sections in the Province in which the Government Grant has been withheld since 1880; giving the reasons therefor in each case, and copies of any correspondence in the Education Department bearing upon the subject. (*Not printed.*)

No. 24.. Return shewing the name of each Colonization Road on which Provincial money has been expended since July, 1867; its length in miles; the constituency or constituencies in which it is situated; the amount expended on it in each year, distinguishing between amounts for repairs and amounts for construction of new road, giving the length of road constructed. (*Printed.*)

No. 25.. Return shewing in detail the expenditures made in the Townships of Hungerford, Elzevir and Seymour, and the Village of Campbellford respectively, by the authority of the Provincial Board of Health and the Local Board of Health, or otherwise, during the late small-pox epidemic that prevailed in these localities, with the number of cases and deaths, and the length of time the epidemic prevailed: the ages of the patients, and the number of such who have been vaccinated or re-vaccinated. (*Printed.*)

No. 26.. Return of the number of Hotel and Saloon Licenses authorized to be granted in the Town of Peterborough, for the year 1883-4, under the Crooks' Act, and the number of such Licenses actually granted. (*Not printed.*)

No. 27.. Return of:—(1) Copies of the information and evidence submitted to, and taken before Mr. P. McCurry, Stipendiary Magistrate of Parry Sound, at the instance of the Parry Sound Lumber Company, against Henry May, James May, William Micklam, William Brown, ——— Crawford and William Brand, or any of such persons, on a charge of alleged breach of agreement, by the said persons, or some of them, with the said Parry Sound Lumber Company, upon which information and evidence the said persons, or some of them, were convicted and sentenced by the said Stipendiary Magistrate to imprisonment, and actually imprisoned, notwithstanding the provisions of the Dominion Act, 40 Vic., cap. 35, which abolishes imprisonment or any summary remedy in any such cases between master and servant. (2) A copy of the written agreement entered into with the said Company by the said persons or any of them, if the same, or a copy thereof, was filed with the said Stipendiary Magistrate. (3) A copy of all correspondence by or with the said Magistrate, in reference to the said convictions, with any person or persons. (*Not printed.*)

No. 28.. Supplementary Return shewing:—(1) The several lots in the Townships of Tudor, Wollaston, Limerick and Faraday, in the County of Hastings, which have been sold, located, disposed of or applied for since January 1st, 1880. (2) The dates of the said sales; the persons to whom sold; the prices paid and the terms of payments. (3) The dates of the several applications for the purchase or location of said lots. (*Printed.*)

No. 29.. Papers respecting the case of Dr. John Francis Dowling, Member for the South Riding of Renfrew. (*Printed.*)

No. 30.. Report of the Commissioner of Crown Lands for the year 1884. (*Printed.*)

No. 31.. Return shewing in detail all sums paid or claimed for specimens of minerals or other products of the District of Algoma during the past year, for exhibition in Ontario or elsewhere, with the names of all persons by whom and to whom such payments were made, or by whom such claims were made, together with all papers, documents or communications conferring upon any person or persons authority to collect such exhibits, and all reports or communications made to the Government or any member or officer thereof by such person or persons. (*Not printed.*)

No. 32.. Return of copies of all correspondence between the Government of Ontario and the Government of the Dominion, respecting the Dominion Liquor License Act of 1883. (*Printed.*)

No. 33.. Order in Council commuting the fees of His Honour Judge Dean of Victoria. (*Not printed.*)

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No. 38.. Report on the Institution for the Education of the Deaf and Dumb for the year ending 30th September, 1884. (*Printed.*)

No. 39.. Report upon the Hospitals of the Province for the year ending 30th September, 1884. (*Printed.*)

No. 40.. Report on the Institution for the Education of the Blind for the year ending 30th September, 1884. (*Printed.*)

No. 41.. Report on the Houses of Refuge and Orphan and Magdalen Asylums aided by the Province, for the year ending 30th September, 1884. (*Printed.*)

No. 42.. Return shewing all Provincial Railways (Ontario), which were by the legislation of the Parliament of Canada of 1883 declared to be Dominion Railways. The mileage of each said Railway. The amount paid to each by the Provincial Government and by the Municipalities respectively. (*Printed.*)

No. 43.. Return of copies of all correspondence, papers and documents relating to the estreated bail bonds of one Lyons, committed for trial by the Police Magis-

trate of St. Thomas, on a charge of burglary, or larceny, in the possession of the Honourable the Attorney-General, or in his Department. (*Not printed.*)

No. 44.. Return from Queen's Printer as to the disposal of the Sessional Statutes for the year 1884. (*Not printed.*)

No. 45.. Return of copies of all correspondence and other papers which may have passed between the Government of Ontario and the Governments of the Dominion and Quebec, touching the final settlement of the financial affairs of the late Province of Canada, except so far as already brought down. (*Printed.*)

No. 46.. Annual Statement for the twelve months ending 30th June, 1884, of Upper Canada College. (*Not printed.*)

No. 47... Return of the names of all persons who have made application to the Department of Education through the Public School Inspectors in each County, for permits to teach for the years 1882 and 1883; the names of persons to whom such permits have been granted; the date of such permits; date of cancellation and dates of renewal, if renewed. (*Not printed.*)

No. 48.. Return furnishing the full text of the judgment of the Judges of the Queen's Bench Division of the High Court of Justice, on the Demurrer in the case of the Queen *vs.* Bunting and others. (*Printed.*)

No. 49.. Return shewing the indebtedness of any Municipality to the Government, whenever the same may be in arrears for over one year, either on account of principal or interest. (*Printed.*)

No. 50.. Statement of the Fees and emoluments received by the Registrars of Ontario for the year 1884, made in accordance with the provisions of the R. S. O., cap. 111, sec. 97, and 43 Vic., cap. 3, sec. 2, with which are contrasted receipts of same nature in 1882 and 1883. (*Printed.*)

No. 51.. Return shewing the Text Books authorized by the Education Department in Geography, Grammar, and English History, and now used in the Public Schools of this Province. (*Printed.*)

No. 52.. Return shewing in detail as to each Municipality:—(1) The amount of the original indebtedness of any Municipality to the Province under the Ontario Drainage Act. (2) The number and amounts of the rent charges originally payable in respect thereof. (3) The sum paid on account thereof. (4) The amounts in arrear for such rent charges. (5) The amount of rent charges yet to mature. And also a return of all correspondence and communications between any member or officer of the Government and any one on behalf of the said Municipalities as to the said arrears, or the reduction thereof, where any such reduction has been made, or of the claim of the Government in respect thereof, and also of all Orders in Council reducing or readjusting the indebtedness of any of the said Municipalities, and also shewing the amount of reduction in each case. (*Printed.*)

No. 53.. Return shewing the names of teachers on the superannuation list; the date of their superannuation; the amount received by each; their place of abode at the time of superannuation, and by whom their superannuation was recommended. (*Not printed.*)

No. 54.. Return of copies of all correspondence with reference to the application of Henry S. Mitchell to be appointed Notary Public. (*Not printed.*)

No. 55.. Return from each Registry Office, giving, for the final nine months of the year 1884, the following particulars :—(1) Number of absolute transfers and amount of fees received therefor. (2) The number of mortgages and the amount received therefor. (3) The number of discharges of mortgages and the fees received therefor. (4) The number of leases and the fees received therefor. (5) The number of wills and probates and the fees received therefor. (6) The number of patents and the fees received therefor. (7) The number of assignments of mortgage and the fees therefor. (8) The number of powers of attorney and the fees received therefor. (9) The number of bonds and agreements for sale of land and the fees received therefor. (10) The number of searches and abstracts and the fees received therefor. (11) The fees received for registering certificates, by-laws, plans and other instruments and services not enumerated and the fees received therefor. (12) Total amount received for registry fees. (13) The amount of surplus (if any) payable to the County. (*Printed.*)

No. 56.. Return of copies of Extracts, etc., from the Reports and Proceedings of the Special Committees appointed by the Imperial House of Commons in the years 1876 and 1877 to enquire whether it might be expedient to render employers liable for injuries occasioned to their servants, etc., and a copy of a letter addressed by Lord Justice Bramwell to Sir Henry Jackson, a member of said Committee, with respect to the matters inquired into by said Committees. (*Printed.*)

No. 57.. Report of the Inspector of the Elgin House of Industry and Refuge for the year ending 1st November, 1884, as required by section 460 of the Consolidated Municipal Act, 1883. (*Not printed.*)

No. 58.. Return of copies of all correspondence between the Government and the Council of University College respecting the admission of women to that institution, and shewing :—(1) The number of women attending classes in University College up to the date of the Return, distinguishing between matriculated and non-matriculated students, and between residents and non-residents of Toronto. (2) The number of women taking honour work in each Department in each year of the curriculum. (3) The amount spent by the Government and the College Council, as the result of the admission of women, with the objects for which it was spent. (4) The number of women undergraduates in each year of the Toronto University course ; and (5) The number who have passed successfully in any of the groups of subjects at the local examinations for women, held under the auspices of the University, distinguishing between the first, second and third examinations. (*Printed.*)

No. 59.. Return shewing the number of licenses granted for the keeping of Private Lunatic Asylums for the years 1882, 1883, and 1884 ; the names of all persons obtaining such licenses, and the date of their issue. (*Not printed.*)

No. 60.. Return of copies of all correspondence between William Coe and the Crown Lands Department, relating to lands sold to him in the year 1883 ; also, for a copy of the Report of the Commissioner of Crown Lands to the Lieutenant-Governor in Council on the sale made in such year 1883 ; also a copy of the Order in Council confirming such sale ; also, as a supplementary return presented to the House during the present Session states the terms of said sale were cash, a statement of dates of payments made on account of said sale. The above Return to apply only to lands sold in the Townships of Wollaston, Limerick, Faraday and Tudor, in the County of Hastings. (*Printed.*)

No. 61.. Return of all papers, documents and correspondence to or from the Government or any member thereof, since the first day of March, 1884, to the present time, respecting the conduct of Samuel Stanley Peck, Esquire, Stipendiary Magistrate and Division Court Judge for the Provisional County of Haliburton, at the Municipal elections held on the fifth day of January last, in the Township of Minden, and subsequently thereto, and of any official or other information respecting the citizenship of the said Peck, and of any communication respecting the debt of the said S. S. Peck to the said Provisional County whilst treasurer thereof. (*Printed.*)

No. 62.. Abstract of Returns of Receipts, Expenditures, Assets and Liabilities, for the year 1884, of the Municipalities of the Province of Ontario, made by Clerks of Municipalities pursuant to 43 Vic., cap. 24, sec. 6, with the population of each Municipality. (*Printed.*)

No. 63.. Return of copies of all correspondence between the Department of Education and the Inspector of the County of Dufferin or the Trustees of School Section No. 1, East Luther, or any other person, relating to the Division of the said School Section. (*Not printed.*)

No. 64.. Return shewing the number of certificates of Railway Annuities and the amounts of the same which have been either sold or exchanged for any portion of the outstanding Railway Scrip, as authorized under the provisions of cap. 31, 47 Vic.; to whom sold or with whom exchanged; the terms upon which such sale or exchange was effected, and when sold; the date of the receipt of the money therefor. Also a copy of the advertisement asking for tenders, with copies of all tenders received in response thereto. (*Printed.*)

No. 65.. Return of copies of a certain memorandum or scheme with regard to a Federation of the other Universities and Colleges in Ontario with University College, and of all reports or resolutions of the governing bodies of the University of Toronto and other Universities or Colleges in relation thereto, and copies of any other documents affecting the proposed Federation. (*Printed.*)

No. 66.. The Bursar's Statement of Cash Transactions of the University of Toronto and University College, for the year ending 30th June, 1884. (*Printed.*)

No. 67.. Return giving a statement of all the real property belonging to the Endowment Fund of Toronto University, University College, and Upper Canada College, and the value thereof, and of all other property, namely: Debentures, Mortgages; Bank Stock; Balances that may be due on Sales of Land; Cash Balances in Banks; and any cash that may be in hand as on the 31st June, 1884; the income derived from the said property for the years 1883 and 1884, with the expenditure of the same for the same period; a clear statement shewing the kind of educational work that Upper Canada College is doing in excess or advance of what any well equipped High School is doing or can do. (*Printed.*)

No. 68.. Return shewing the amount spent in scholarships, bursaries, exhibitions and prizes in Toronto University, University College and Upper Canada College during the ten years ending 1883-4, distinguishing between those on public and those on private foundations, and in the case of the University between those granted in the different faculties of Arts, Law and Medicine. Also, amount paid annually, *per* student, by fees in each of the above classes. (*Printed.*)

No. 69.. Return shewing the names of all companies or associations incorporated under chapter 167 of the Revised Statutes, since the year 1877, with the dates and places of incorporation, and particularly the objects of incorporation thereof respectively. The names and like particulars as to companies or associations incorporated since the year 1877 under chapter 158 of the Revised Statutes, being the Act respecting co-operative associations. (*Printed.*)

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No. 72.. Return shewing the lots in the Township of Harvey, in the County of Peterborough, which, while under license for the cutting of timber, have been sold since the first day of January, 1880, with a statement of the date when the right to cut timber under such license would cease in consequence of such sale. Also, the name or names of the license holders whose license covered such lands. (*Not printed.*)

No. 73.. Report of the Dairymen's Association of Western Ontario for the year 1884. (*Printed.*)

No. 74.. Return of copies of all applications made to the Provincial Government for aid to Railways since the passage of the Dominion Act of 1883, declaring Provincial Railways to be for the benefit of Canada, with copies of all correspondence relating to such applications. (*Not printed.*)

No. 75.. Return of all correspondence between the Crown Lands Department, or any officer thereof, and any other person, with reference to the dues charged by timber limit holders to actual settlers upon lots on which they have not been formally located. (*Not printed.*)

No. 76.. Return to an Address, of the fourteenth day of March, 1884, for copies of all Orders in Council passed under the authority of the General Mining Act, creating, extending, adding to, or diminishing mining divisions. (*Printed.*)

No. 77.. Report of the Secretary and Registrar of the Province for the year 1884. (*Printed.*)

No. 78.. Return of all market fees and market rents, salaries of market clerks, with rates of fees now charged and any changes of fees known to the Department since the passing of the Act relating to Market Fees, being 45 Vic., cap. 24. (*Not printed.*)

No. 79.. Return of all correspondence between the Crown Lands Department, or any officer thereof, and any other person, with reference to the opening up for settlement of the Townships of Himsworth and North Nipissing, or any part of them, and also, of all petitions, reports or Orders in Council on the subject; also, for copies of all petitions or applications to the Crown Lands Department for a supply of timber for the purposes of a local mill there, and of all correspondence between the Department and any other person on the subject. (*Not printed.*)

No. 80.. Statement of the Assets, Liabilities, Revenue, Expenditure, etc., of the several Municipalities in the Province, as made by the Clerks of the Municipalities for the year 1883. (*Not printed.*)

No. 81.. Return of copies of all reports made to the Government by Directors of Joint Stock Road Companies for the year 1884, under sec. 146, cap. 152, of the Revised Statutes, as amended by ss. 6 and 7, cap. 25, 47 Vic., and a Return shewing the date of construction of all toll roads in the Province, the number of toll-gates maintained thereon, the rate *per* mile charged as tolls, and specifying the amount of the original capital stock, and the amount of the present stock, with the reasons for an increase, if any, in each case; also a Return shewing the toll roads which have been abolished in the Province, or on which the collection of tolls has ceased, and the manner and terms of their abolition, or the reasons why tolls have ceased to be collected. (*Not printed.*)

No. 82.. Statement in detail of the Receipts and Expenditures on account of the Mercer Estate for the year 1884. (*Printed.*)

No. 83.. Tabulated Analysis of Reports of Electoral, District and Township Agricultural Societies and of Horticultural Societies for the year 1883. (*Not printed.*)

No. 84.. Report of the Bureau of Industries for the Province for the year 1884. (*Printed.*)

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No. 86.. Return shewing what sums have been paid to George R. Patullo on any account whatever since first January, 1883, with the dates of the payment thereof and the purpose for which such payments were made. (*Printed.*)

No. 87.. Return of copies of all correspondence and other documents relating to the cancellation of location of lot number 33 in the first concession of Snowden, in the Provisional District of Haliburton, and of all correspondence and documents relating to the sale or re-location of the same lot. (*Not printed.*)

No. 88.. Return of all correspondence between the Municipal Council of the Township of Roxborough, or any member or officer thereof, and the Provincial Secretary, or any officer of his Department, with reference to the claim made by the License Board of Stormont upon the said Municipality for payment of fifty dollars towards the expenses of enforcing the Temperance Act of 1864 in the Township of Roxborough. Also, shewing the amount demanded from each Municipality in which the said Act was in force for each of the years 1882, 1883 and 1884, and the amount paid in respect of such demand. Also, shewing how the said sum of fifty dollars demanded from the said Township of Roxborough is made up. (*Not printed.*)

No. 89.. Report of the Inspector of Legal Offices, for the year 1884. (*Printed.*)

No. 90.. Report of the Entomological Society of Ontario for the year 1884. (*Printed.*)

No. 91.. Return shewing the several Lots in the Townships of Belmont, Methuen, Anstruther, Galway and Cavendish, in the County of Peterborough, and of the Townships of Cardiff, Monmouth, Snowden, Lutterworth and Glanmorgan, in the Provisional County of Haliburton, which have been sold,

located, disposed of, or applied for, otherwise than under the "Free Grant and Homestead Act," since the first day of January, 1880; also, the dates of the said sales, the persons to whom sold, the prices paid, and terms of payment; also, the dates of the several applications for the purchase, location, and terms of location of said lots. (*Not printed.*)

No. 92.. Return of the names of all persons appointed or employed for the collection of Statistics other than Vital Statistics in connection with any Department of the Provincial Government; the places of residence of such persons, the salary or other remuneration paid or given to them; the dates during which they were employed; the instructions, if any, given to such persons, and a statement shewing the cost of compiling such statistics, such Return to embrace the years 1883 and 1884. (*Not printed.*)

THIRD ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH

OF ONTARIO,

BEING FOR THE YEAR 1884.

Printed by Order of the Legislative Assembly.

Toronto:
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1885.

PROVINCIAL BOARD OF HEALTH OF ONTARIO.

CHARLES W. COVERNTON, M.D., *Chairman.*
HORACE P. YEOMANS, B.A., M.D.
WILLIAM OLDRIGHT, M.A., M.D.
FRANCIS RAE, M.D.
JOHN J. CASSIDY, M.D.
JOHN GALBRAITH, M.A., C.E.
PETER H. BRYCE, M.A., M.B., *Secretary.*

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THIRD ANNUAL REPORT

OF THE

PROVINCIAL BOARD OF HEALTH.

To His Honour the Honourable John Beverley Robinson,

Lieutenant-Governor of the Province of Ontario.

May it please your Honour:

The Provincial Board of Health begs leave respectfully to present this its Third Annual Report. The work of the year has been exceedingly gratifying, as we have had evidence, as a result of the broad-cast dissemination of sanitary knowledge by pamphlets, health conventions, and numerous other means that have been at the quarterly meetings of the Provincial Board determined on, in an intelligent appreciation of the nature of epidemic disease, and an increased knowledge of the best means for its prevention or limitation. The growing appreciation of the work of the Provincial Board has been made abundantly evident by the wide-spread solicitude for the prevention of disease that has been demonstrated in the yearly increasing correspondence that our Secretary has had to reply to. There remains yet a great deal of good work to be done, and if the accomplishment of it proves slower than we would wish, we may take heart of grace in the remembrance that whilst in modern times it has been easy enough to believe that in the darkness of the Middle Ages people poisoned themselves by their own filth, and therefore suffered terribly from the ravages of preventable diseases, yet all communities were slow to believe that familiar diseases like Scarlet fever and Typhoid fever, which they had been in the habit of considering more or less inevitable, were not, perhaps, equally preventable with Cholera and Typhus; and it was with surprise that people not educated in medicine heard during the past few years that one of the first authorities now living, Mr. Simon, had described a large class of maladies as filth diseases. The inhabitants of Europe were taught their first lesson in Preventive Medicine by their Mahomedan enemies, and more attention to cleanliness made the two dreaded diseases, Black Death and Plague, almost unknown. In this conflict with dirt as a cause of disease the beneficial effects of legislation are quaintly described by Captain John Gaunt more than two hundred years ago. Speaking of the freedom of London from the Plague and discussing the causes of this freedom he says, "Whether we are to become less apt to breed or to receive this dreadful evil, one of the causes of this happy event seems to be the greater freshness and purity of the air of London since the rebuilding of it after the great fire, the streets being made wider and the inhabitants not crowded so closely together; as it is, perhaps, owing to its being more thinly peopled than the rest of the world that America has never yet been visited with the plague, while the crowded and filthy streets of Cairo and Constantinople are seldon free from it. Another and probably the most effectual preservation has been the great quantity of water from the Thames and the New River, which for the last century has washed the houses so plentifully, and afterwards running down into the

kennels and common sewers, constantly hinders or weakens the tendency to putrefaction; and if more water could still be derived into our houses, streets, and common sewers, it might, perhaps, fully make amends for the imperfections of quarantine arising from the thoughtlessness, negligence, avarice, and obstinacy of those who may have the direction of them, or of those by whom they should be performed." We have, then, here clearly pointed out three of the great health factors—pure air, pure water, and freedom from the poisonous organic emanations of dense population. For overcoming ignorance, prejudice, and criminal apathy, unceasing efforts are required. Nearly three-quarters of a century elapsed after the discovery of the means of preventing scurvy before they were sufficiently appreciated to be used in the Royal Navy, after long years of representations to the Government of the day by Sir Gilbert Blain; and it has taken a long period of time for the general understanding to be arrived at that Preventive Medicine may in a great measure be resolved into the broad principles of pure air, pure water, pure soil, and clean houses. Forty or fifty years ago Preventive Medicine consisted in trying by quarantine to keep out disease; now it consists chiefly in removing the conditions favourable to its existence and spread.

Among the causes that have contributed to break the force of infectious diseases may be placed in the first rank the improved sanitary conditions under which we live, and the increasing knowledge of the nature of epidemic diseases, and the way in which they are propagated; but even in the present day, the mortality from infectious diseases forms an extraordinarily large portion of the total mortality. The germ or *contagium vivum* theory of disease is not, as by many conceived, exclusively of modern conception, for the theory that the poison of infectious diseases consists of living creatures, or low organisms, is to be found among the writers of antiquity, was revived two centuries ago by Lancisi Leenwenhöeck, Reaumur and others; again, however, to be discredited until within the middle of the present century, when the idea was again elaborated by Henlé. Since 1840 extended microscopic investigations have demonstrated the mode of propagation and significance of these low organisms; new facts in regard to the extension of epidemic diseases, and the reliable discoveries of numerous investigators, have been the means not only of furnishing definite proof of its correctness, but of leading to results of the greatest theoretical and practical importance. The most important of these results, viz., the knowledge that the poisons of infectious diseases can reproduce themselves, and breed true to an unlimited extent, Liebermeister forcibly illustrates in the virus of vaccine. With a minimum quantity of this we vaccinate a child and obtain vaccine virus from him. From this child ten, and even more children, may be successfully vaccinated; from each one of these children ten more in turn, and so on. So that what at first was a scarcely appreciable quantity of the virus of the disease is sufficient to produce it in 1, 10, 100, 1,000, 10,000 children, until the virus loses its force and a necessity arises for returning to the animal virus. As with vaccine virus, so with that of Small-Pox, Measles, Scarlet Fever, Typhoid, Syphilis, Blennorrhœas, the poison can be multiplied to an endless extent. The peculiarity of infectious diseases is their specificness; *i. e.*, a given kind of disease is solely due to a given kind of morbid agent or cause. Inoculation, with the virus of Small-Pox, produces alone Small-Pox; infection from a patient with Measles, produces Measles; germ of Cholera, Cholera alone, and the same limitation of effect from the specific germ of all other infectious diseases. From this specificness the conclusion has been naturally enough arrived at, that these various diseases never originate spontaneously, but are dependent on a transmission, a continued propagation of the disease poison. The study of germs as causative of specific disease, by Henlé, Sanderson, Pasteur, Koch, Cohn, Klein, and many others, has, within the last few years, been attended with most promising results in the cause of Preventive Medicine. We have acquired much, and hope to obtain more, knowledge of diseases, to be able to remove the cause of many, diminish the perils arising from others, save many persons from inevitable death, and by observance of sanitary precepts, prolong the duration of life. Fuller knowledge of the exciting causes of disease has enabled the profession to advance greatly in their prevention. The advantages that have resulted in England and Wales alone may be seen in the general death-rate, which, on an average, has been steadily declining for the last twenty years, particularly since the passing of the English Act of 1875. Steady average progress since then has been apparent, the decrease, as

shown by Dr. Finlay, being from 22.8 in 1875, to 18.9 in 1881, and 19.6 in 1882, the last year from which the complete returns of the Registrar-General have been published. Stated in numbers, the following results are shown by this gentleman:

Taking for comparison with the years subsequent to 1875, the average death rate of the ten years, 1866 to 1875 inclusive, is 22.2. The same rate in 1876 would have meant the death of 30,699 persons who were alive at the close of the year. In 1877, 47,821 additional persons would have died; in 1878, 15,860; in 1879, 36,981; in 1880, 42,226; in 1881, 86,619; and in 1882, 69,714. If, then, these figures are correct, we have a saving of lives amounting to more than 329,000. Referring to the last three cholera epidemics, Dr. F. sees further ground for the influence claimed for sanitary medicine in diminishing mortality. The epidemic of 1848-49 was responsible for 54,398 deaths; the fatality of that of 1854 was represented by 20,097; while in that of 1865-66 only 14,378 lost their lives, a fourth only of the mortality of the first-named epidemic. We find then in these figures of greatly diminished mortality from epidemic cholera the most convincing evidence that by a strict observance of sanitary laws, equally by individuals as by communities, as also by great vigilance at our sea ports, this dreadful disease, if it should visit our shores, as in previous outbreaks in Europe it has after an interval of varying duration constantly done, would in a very great measure be robbed of its terrors. Under the operation of the Health Act for this Province, passed the last Session of the Provincial Parliament, the Provincial Board have reason for congratulation in the advanced means supplied for bringing before the inhabitants, through the instrumentality of Local Boards, the means for securing improved systems for the removal of nuisances, thus leading to a greatly improved sanitation. Since the 1st of July of last year there have been established in the Province 400 Local Boards of Health, two-thirds of all the municipalities thus possessing local health organizations. In the total of 447 townships there are 184 Boards. Of these 184 Boards, 25 of them have appointed Medical Health Officers, and 19 of them have appointed Sanitary Inspectors, while 17 of them have appointed both Medical Officers and Sanitary Inspectors. Of the 203 cities, towns and villages in Ontario, 180, or more than six-sevenths, have Local Boards of Health. Of this number of Boards 155 either have a Medical Health Officer or Sanitary Inspector, while 63 of them have Medical Health Officers, 92 have Sanitary Inspectors, and 44 Boards have both a Medical Health Officer and Sanitary Inspector. From this statement it will appear that under the operation of these Local Health Boards so numerously established, the work of diminishing the spread of Cholera and other infectious diseases by timely sanitary precautions will be greatly facilitated, and the Province generally placed in the requisite state of preparedness. From the visit of the delegates sent by the Dominion and Ontario Governments to the conferences of the State Boards of Health of the United States, the first on the 7th of October at St. Louis, and the second at Washington on the 10th of December, there is reason for believing that greatly increased precautions will be taken at the several English ports in the inspection of crews, passengers and cargoes of all ships leaving for either American or Canadian ports: all the delegates concurring in the opinion that in the past many necessary preventive measures have been either performed in a very perfunctory manner, or entirely neglected, and, as a consequence, on this side of the Atlantic we have been exposed to epidemics of European importation, that might have in a great measure been prevented or by timely warning limited in extent. Measures at these conventions, and in subsequent interviews with the British Ambassador and Sir John Macdonald, were proposed which, if carried out by the Medical Health Officers of the various British seaports, will greatly tend to the minimising of the dangers to which we have hitherto been exposed.

The Board would further observe that whilst at European ports many precautions might be initiated calculated to diminish the danger of importation of epidemic disease; there are also additional precautions to be observed at our own Quarantine Stations, as at Rimouski, Grosse Isle, and Quebec, in order to secure the desired immunity, such as suitable Houses of Detention for passengers who have been exposed during the voyage, or previous to embarkation, to infection, but in whom in this age of rapid transportation the period of incubation had not elapsed; and as an additional precaution in the instance of individuals who have received the infection into their systems only a few days before

the arrival of the ship, and the period of incubation consequently not terminated,—the appointment of Health Officers at different points along the lines of our great trunk railroads, clothed with the necessary powers for removing the infected for treatment at properly fitted-up isolated buildings, and, if judged necessary, ordering the detention of the exposed for the requisite period of time for determining whether they had taken the contagion.

In the recent Act for making further provisions respecting the public health, excellent and comprehensive as it is, there is one omission that calls for notice, and which at the next meeting of the House it is to be hoped may be provided for, viz., the practice of intramural interments in the two Cathedrals of the city of Toronto, and the nearly equally objectionable practice of public cemeteries in very close proximity to towns and villages, without due regard being had to the nature of the soil, where, in the estimation of joint stock companies, they could be most remuneratively located. Fully realizing the danger that sooner or later might accrue from this dangerous custom, the Board issued a circular inviting answers to questions of locality. In a large number of instances the burial places were on the outskirts of the villages, towns, or cities, and in a very large proportion the soil sandy. In one city the cemetery was on outskirts of the city, twenty feet above the level, and soil sandy. In several towns two cemeteries were within corporation limits. In one village two cemeteries were in its centre, with sandy soil. The inhabitants have been frequently warned of the danger by a resident medical man, who has vainly sought to have them closed. In the eighty answers received, there is a large proportion indicating danger at no distant date. The influence of a cemetery on the hygienic conditions of the neighbourhood varies according to the nature of the soil, the abundance of ground water, the number interred, etc., etc. An absolute answer, therefore, to the question of amount of danger to the public can scarcely be given, as each case would involve a minute investigation on the nature of the soil destined for such a purpose. There are, however, certain points concerning the choice of ground for a cemetery formulated by Dr. Gosse in his Report to the Fourth International Congress of Geneva, held in September, 1882, which should be generally accepted :—

(*a*) Limey and flinty soils, situated on the declivities of land, should be chosen.

(*b*) Permeable clay soils mixed with sand and gravel should only be chosen when none other can be found.

(*c*) Soil formed of compact clay should not be utilized for cemeteries before being submitted for a long time to cultivation. To these conditions it is necessary to add that a soil should not be used where the ground water reaches the bottom of the graves, so that the coffins are surrounded by water.

One of the important provisions of the new Health Act, page 2, section 3, being with regard to the powers of the Provincial Board to make regulations for the prevention or mitigation of threatened epidemics, it will therefore be in order to detail the precautions taken by the Board since the danger of cholera has become imminent, in addition to the ordinary sanitary precautions impressed upon the local sanitary authorities, viz. :—

1. Articles in leading journals regarding the urgency for efficient Dominion quarantine.

2. A circular to all cities, towns, and villages, requesting immediate information on local sanitary conditions.

3. A careful consideration of the dangers from cholera, taken at the August quarterly meeting, and the adoption of resolution. *Vide* Appendix.

4. Communication of these, with request for concerted action, to Dominion and to other Provincial authorities.

5. Attendance at the St. Louis and Washington conferences, and to the repeated urging of the Reports adopted at these conferences upon the Dominion Government.

6. With reference to the question of the amount of local sanitation accomplished, it may be stated that the various Local Boards have reported their organization from almost every city, town and village in the Province, and from nearly half of the townships,

many of which are sparsely settled. Nearly 75 per cent. of the total population are under sanitary control. The Health Act of the present year requiring annual reports to be sent by the Local Boards to the Provincial Board, we have to acknowledge over two hundred received, many voluminous, and all displaying both intelligent appreciation and surprising progress in the work of local sanitation that has been placed upon them since the passage of the new Health Act. In illustration of the successful working of this Act, a brief reference of successful limitation of an outbreak of Small-pox, through the active agency of our secretary, may with propriety here find place. Full details are given in the Appendices. On the 18th of November, Dr. Bryce was telegraphed to visit the Township of Hungerford, to decide whether the outbreak was really one of Small-pox. On the 19th, finding on his arrival that this disease had to be dealt with, he took the necessary steps for the appointment of a Board and the nomination of fifteen sanitary inspectors for five villages, inducing the township to pass a grant for the necessary expenses, to appoint a Medical Health Officer for the township, and to swear in special constables to prevent the exposure of the uninfected with the infected. He caused to be extensively printed and placarded the clauses of the Act relating to disinfection, and addressed letters to the railway officials requesting them to give orders to conductors of trains to allow no passengers to board without a certificate from the Medical Health Officer. A stage line was also subjected to the same conditions. On the 29th, on again visiting the township, he found established an isolation hospital, and caused careful quarantine precaution to be taken. On the second of December he made a third visit, taking with him two medical men from Toronto, one to co-operate with the local Medical Health Officer in control of a district, and to act as a public vaccinator and to organize and superintend a fumigating corps, and the other to take charge of a number of families in an outlying district. Finding that the panic had become wide-spread, and that but few of the uninfected had remained in Stoco village, Dr. Bryce, on returning to Toronto, secured the services of a trained nurse for hospital aid, and of three experienced men to act as sanitary policemen and as a fumigating corps. The second day of the arrival of the physician in the outlying district he reported to the Provincial Board that he had visited thirty-one patients not previously seen by a medical man.

From the ladies of Toronto and Belleville a large supply of complete suits of clothing was sent to the fumigating corps, to replace the infected apparel destroyed. Of the two hundred and two cases, some time ago reported, there was a record of forty-five deaths. For the safety of our population from this disease, it is a matter of great regret that clauses 4, 5, 7, 8, and 9 of the Act relating to vaccination, page 1970 to 1973, vol. 2, Revised Statutes, Ont., should not be rigidly enforced, as a somewhat similar Act is in England. We find in the thirteenth annual report for 1883-84, sent to our Board by Dr. Buchanan, the Medical Officer of the Local Government Board, that the public vaccination of the country was supervised during the year ended December 31st, 1883, by the Board's Medical Inspectors, whose inspections included 340 Unions, containing 1,645 vaccination districts. The allegations of injury from vaccination had in several instances formed the subject of inquiry by the Board's Inspectors, the result reported not bearing out the charge. From the customary analysis of the returns of vaccination officers in England, made for the year 1881, it appears that no more than 3.8 per cent., or, with inclusion of postponed cases in consequence of unfitness of children at the time of presentation, 4.5 of the births registered during that year are unaccounted for as regards their vaccination. The local registers show 86.6 per cent. of the children born in the year to have been successfully vaccinated, and 8.8 per cent. to have died within the period during which they may lawfully remain unvaccinated. Dr. Buchanan mentions that in the year 1881 the deaths from Small-Pox among the relatively few unvaccinated children in England and Wales were very closely ten times as numerous as among the twenty fold larger number of vaccinated children, the rate of mortality in the two classes differing about as 200 to 1. During the last year we have had in Ontario several outbreaks of Diphtheria, notably one at Smith's Falls, and in many instances the outbreak has been referred to impure water supply, in some isolated cases to sewer gas finding entrance into the dwelling, both of which are likely to be causative. As, however, epidemics of this disease occurring in England have been clearly traced to the milk supply, I quote a passage from report of its appearance in

strange groups of cases in parts of England different and distant from each, in one instance by Mr. Power, and in another by Dr. Parsons, Inspectors of the Department. Mr. Power, in his investigation of the epidemic at Hendon, that had occurred in the practice of Dr. Cameron, says, "the results of more extended inquiry tend to confirm the *prima facie* conclusions of Dr. Cameron. For, bringing into account all throat illness that could be heard of as having occurred in the village during the first ten days of January, there were 15 houses invaded, all but two of which had obtained milk from a particular dairy that had been called in question; all the definite Diphtheria attacks and all the fatal cases occurred among customers of this dairy. It was found that the sewers from that portion of the village wherein are situated the residences of the cases that occurred in November, discharge into a ditch, which eventually passes within 22 paces of, and at a higher level than, a certain pond from which the particular dairy farmer drew water for his dairy purposes."

In England, as at the Johns Hopkins University at Baltimore, during the last year, most important investigations in the use and application of disinfectants or germicides have been instituted, in the former country by Drs. Burdon Sanderson, Klein, and Dowdeswell; in the latter by Dr. Sternberg, United States Army, Dr. Raymond, Brooklyn, Dr. Rohé, Baltimore, and a staff of assistants. The report of these gentlemen will, in a few weeks, be published. From the English scientists a report will be found in the appendices to the 13th Annual Report of Local Government Board for 1883-84. They concern chiefly the question of infection, and from the labours of these gentlemen great medical results have been arrived at.

Mr. Dowdeswell reports on the "Charbon Symptomatique," supposed to be identical with the black quarter or quarter evil of English veterinary surgeons. The principal interest of this disease to pathologists is the nature of the relation in which these microphytes stand to the production of disease. A bad epidemic of sore throat, was clearly traced last year at Dover, England, to the prevalence of this disease among the cows of a dairy farm in the vicinity. Four hundred cases of sore throat occurred in a week among the customers who had been supplied with milk from this source; it is obvious, therefore, that skilled veterinary surgeons should be appointed by the Ontario Government to inspect the cows of all dairy farms at such intervals as may be determined on, and thus prevent the dissemination of the pathogenic germs determining specific disease. It may be, perhaps, argued that the presence in the blood, secretions and excretions of various germs, is no absolute evidence of causation of disease. They have certainly, however, the character of specificness, the various germs of Scarlet Fever, of Cholera, of Smallpox, for producing only these respective diseases, whether they may be antecedent or only the result of the morbid conditions in which they are found. We do, however, know as a certain fact that the germs of infectious diseases can reproduce themselves to an unlimited extent.

In view of the importance which the probable introduction of Cholera during the coming year, has to the public, and in connection with the work of the Board, we deem it proper that some special reference to the history of the disease in the past should be made. In Parkes' Hygiene, vol. 1, page 53, we read that in 1849 the late Dr. Snow, in investigating some circumscribed outbreaks of Cholera in Horsleydown, Wandsworth and other places, came to the conclusion that in these instances the disease arose from cholera evacuations finding their way into the drinking water. In 1854 occurred the celebrated instance of the Broad Street pump in London, which afforded more convincing evidence that in that instance the germ or poison of Cholera found its way into the body through the drinking water. Mr. Radcliffe in 1865 recorded a remarkable and undoubted case of Cholera from water poisoning, and in 1866 an unequivocal case of the production of Cholera by drinking water from a tank on board a steamer at Southampton. The late Professor Graves, of the Dublin School of Medicine, in his most valuable work, entitled "Studies in Physiology and Medicine," remarks:—"It is strange what a general disinclination has existed for some time in Great Britain to allow that diseases are contagious. The influence of capital has for obvious reasons been brought to play, and every expedient has been resorted to, no matter at what danger to the public health, to try to diminish the stringency of the quarantine laws, and thus to remove the obstacles of trade." Among a large number of cases cited by this eminent teacher in proof of the contagiousness of this

disease, I select the following. The first is a communication from Sir James Simpson, of Edinburgh, who states that in the Cholera hospital of that city four nurses were attacked, three died. Another communication from Dr. Dillon, of Tuam, that four out of ten nuns engaged in attending the sick with this disease died, and three of the men employed to bury the dead died, and in Castlebar two out of five medical men died. Dr. Little, of Sligo, wrote to Dr. Graves, that of nine physicians attending the sick in Sligo seven died. Cholera first appeared in Tuam on 4th of June, 1832, having attacked Galway, the nearest seaport, on the 12th of May. The first case was a fish kedger's wife, who had purchased the clothes of a woman who had died in the Cholera hospital at Galway. She died the following night. Her sister, from a remote part of the town, who attended her and washed her body, was the second victim. A relative from a neighbouring village, who attended her and assisted in the washing, was the third. None lived over twelve hours. Cholera ceased for the first time in Tuam in August; the bedding was all put up clean in store. In September, the court house, which had been the temporary hospital for cholera cases, was required for the sessions. The apothecary with two other persons were employed for nearly a whole day in the removal of the stores. The apothecary and one of the men were seized with Cholera the following night and died.

Another letter from Dr. Little to Professor Graves contains the following paragraph: —"There was scarcely a single case which I had, out of 550 attended in Tuam in 1832, which I could not and did not trace to contagion as satisfactorily as ever such a tracing could be effected. Every case of cholera which came from any house was followed by one, two or three more, and in many instances where patients returned from the cholera hospital, cases were brought in from the houses into which they went within twelve or twenty-four hours after their entrance. In Central India Dr. Townsend, in his report on Cholera, has given strong reasons for believing that the cholera of 1868-69 was to a large extent dependent on water fouling. Dr. Macnamara has given some good evidence on same side, and Dr. Cleghorn has noted striking proofs of the same facts. Professor De Chaumont, in the last edition of Parkes' Hygiene, furnishes a large number of cases equally illustrating its contagious nature, and arrives at the conclusion that the cholera evacuations, either at once or after undergoing some special fermentative or transformation change, pass into the drinking water or float in the atmosphere, being in either case received into the mouth and swallowed, and produce their effect directly on the mucous membrane or are absorbed into the blood. Lebert, in his history of Asiatic Cholera, states its first appearance at Jassore in 1817. In this first year the number of cholera victims in India is given at 600,000. In 1818 Cholera spread all over the Bengal presidency, and yearly epidemics followed with great loss of life until 1823, in which year it penetrated to the foot of the Lebanon. In 1831 the central region of the Russian Empire was seized upon, and in October, 1831, it reached Sunderland on the east coast of England. In 1832 it crossed the Atlantic ocean and appeared in North America. It was very severe in Quebec and Montreal, and New York was attacked as early as July, and Philadelphia and Baltimore in rapid succession. Dr. Lebert remarks that the manner in which cholera attacks persons who come in contact with patients, their discharges, linen or dead bodies, is perfectly in harmony with the germ or parasitic theory of the disease. The resident physicians, assistants and nurses are much more frequently attacked. Their contact with the sick is much more protracted, and not unfrequently local epidemics are developed in hospitals which infect transient visitors rarely or but slightly, while residents or those whose stay is longer, are attacked much more frequently and intensely. It must be clearly the cholera germs to which is due the frequency of attacks among washerwomen. Whenever they wash linen soiled with cholera dejections, without any precaution, they are attacked in all places in no small number. In Branson, in the canton of Valois, in 1867, one of the Sisters of Charity nursed with the greatest self-sacrifice all the cholera patients in very filthy chambers, and yet remained healthy. At the close of the epidemic her sympathy prompted her to assist in washing the soiled linen, when she was attacked with the disease and died. It was from a washerwoman, who died after washing the clothes of a cholera fugitive, that the epidemic developed later in Zurich in 1867. There can be no doubt that infected drinking water may act injuriously in the spread of Cholera.

Frankland, "On the water supply of London and the Cholera," in *Quarterly Journal of Science*, 1867, relates a striking example of this:

On the 18th of August, 1866, a family removed from London to Margate; on the 26th there was a storm, with a heavy fall of rain, and the water had an unusual colour and taste. On the 27th four persons were attacked with Cholera, on the following day still more, the most of whom died. The cesspool adjoining the garden had clearly poured its contents into the well after the overflow caused by the rain, and this had caused the fatal contamination. It was proved that all who were attacked had drunk from the well. The inhabitants of London who used Thames water from Kew, some miles above London, showed a mortality of only 8 to 10,000, those who used Thames water at Hammersmith 17 to 10,000, those from Battersea to Waterloo Bridge—water contaminated by city sewage—163 to 10,000. The various epidemics of Cholera in Europe, as also in this country, furnish a very large number of convincing instances of the contagiousness of Cholera from water contaminated with the cholera poison or germ, or from exposure to soiled clothing, or from clothing that had been washed without disenfecting precautions. But sufficient evidence has been adduced to justify the Report of the Committee appointed for considering the means to be adopted—State and International—for diminishing the chances of the introduction of the disease from Europe to this continent, at the Convention of State Boards held last October at St. Louis, Mo., and subsequently endorsed at the adjourned meeting at Washington on the 10th of December. Under existing systems of rapid, almost daily, intercourse between the two continents, absolute exclusion is impossible: at the same time it is quite possible to minimize the danger by a most rigid watch on travel, and on goods imported, by detention for the period of incubation of the disease of all persons who may have been exposed, and by agitating for co-operation with British and European Governments in the important work of isolation, detention, provision for treatment of the first premonitory symptoms, and requisite disinfection. Concerted action with the American State Boards and the Provincial Board of Ontario has, at the Conventions mentioned, been arranged, and from interviews held by the delegates from our Province and delegates from Province of Quebec, with the British Ambassador at Washington, and subsequently with Sir John Macdonald, the Board has reason to hope that the subject of increased vigilance at ports of departure will be pressed on the attention of European Governments, and thus secure to the people on this side of the Atlantic a greater immunity from the importation and spread of infectious diseases than has existed in the past.

The Secretary's Report will embrace a detailed statement of the work of the year, which has largely increased since the coming into operation of the new Health Act. That this has worked admirably in the cause of improved sanitation, and has enabled the Board to give practical effect to the work of education in Hygiene, to which, under previously existing legislation, it had been confined to the mere circulation of literature on the subject, is certainly a matter for congratulation.

Full reports of investigations into causes of disease, malarial or zymotic, will appear in the appendices; it may be well, however, to pass very briefly in review the various subjects that have occupied the attention of the several members.

Outbreaks of Typhoid having occurred during last year, a very brief notice of individual efforts may be here recorded. Information of the existence of Typhoid at the Reformatory at Penetanguishene having been sent to the Board, Drs. Oldright and Bryce made the requisite examination, suggested alterations in the drainage, plumbing, ventilation, and water supply, on the completion of which followed a return to health. Similar investigations and recommendations were subsequently made at the Lunatic Asylum at Kingston by Drs. Oldright and Rae. An inspection of the ventilation and drainage of the Model School at Toronto was carried out by Drs. Oldright and Cassidy. Drs. Oldright and Galbraith, the members of the Committee on Sewage, have been requested by the municipalities of London West and London East to investigate and report on the present faulty condition of the sewerage and disposal of sewage in that city, which request will be complied with on the call of the officials. Similar request for passing judgment on extension of sewage at Parkdale has been made.

Addresses were delivered by Drs. Cassidy, Oldright and Bryce at the Canadian

Institute, and by the same gentlemen, as also Dr. Covernton, at the Ottawa Convention in March last. Dr. Yeomans conducted to a successful termination an investigation into the causation of an epidemic in the township of Luther. He also delivered a lecture to the school teachers of the County of Haldimand on the 29th of May, on "Sanitary Supervision of Schools" at the convention held in Dunville, in addition to the regular course of lectures on school hygiene that for some years back he has been accustomed to give at the Model School of the County of Wellington.

Investigations during the year were made by the Secretary and other members of the Board at the following places into alleged nuisances and other sanitary matters :—

Teeswater.—Enquiry into nuisance caused by a jam in a stream.

Aylmer.—Information asked *re* system of water works about to be constructed.

Madoc.—Lecture delivered by Secretary before Teachers' Association, *re* sanitary matters.

Point Edward.—Small-pox outbreak. *Vide* Report, in Appendices.

Almonte.—Investigation by Secretary *re* Typhoid outbreak.

Smith's Falls.—Visited by Secretary *re* epidemic of Diphtheria. Lecture on sanitary matters delivered.

Parkhill.—Correspondence with Mr. Graham *re* situation of well.

London West.—Investigation *re* mill-dam nuisance.

London East.—Carling's creek nuisance.

Township of East Zorra.—*Re* Small-pox outbreak.

Woodstock.—Disposal of sewage difficulty.

Haliburton and Peterboro', and other places.—Investigation into sawdust nuisances.

Township of Flos.—Small-pox case.

Penetanguishene.—Nuisance reported by Drs. Oldright and Bryce.

Cornwall.—Correspondence of Mayor with Secretary *re* building of slaughter-houses.

Township of Carden, Co. of Victoria.—Small-pox case.

Woodville, Co. of Victoria.—Typhoid Fever outbreak.

Galt.—Mill-creek nuisance investigation.

Waterloo Township.—Nuisance from polluted creek, and lecture delivered by Secretary before County Teachers' Association.

Bridgeport.—Nuisance investigated.

Hamilton.—*Re* disposal of excreta. Correspondence with Health Officer by Chairman and Secretary. Lecture by Secretary before County Teachers' Association.

Toronto.—Ashbridge's bay visited by Dr. Oldright and Secretary. Evidence thereon by Dr. Oldright in court.

St. Louis, Mo.—Convention. Delegates, Chairman and Secretary. Report thereon by delegates.

Washington.—Convention. The Secretary appointed delegate, but in consequence of urgent work connected with small-pox epidemic in township of Hungerford the Chairman acted as his representative.

During the year 1884 nine hundred and fifty seven letters and six hundred postal cards were written to municipal clerks, Health Officers, and other sanitary authorities.

On the 9th of April a copy of circular reviewing the new Public Health Act was sent to 650 municipalities.

On 10th of June the copy of a letter noting the change in the *Weekly Bulletin* was forwarded to 168 medical correspondents, also a copy of a circular of the date of July 16th, noting the extended shape of the *Bulletin*, was sent to the same parties.

On June 2nd 650 municipal clerks received a copy of circular referring them to *Grip* Printing Company for supply of forms.

On July 24th copy of a letter of enquiry was sent to clerks of cities, towns and villages, respecting the sanitary condition of their respective municipalities. Also in July, a memorandum book for the use of Sanitary Inspectors was prepared, and seven hundred copies distributed.

On the 1st of August a copy of regulations determined on by the Board at the quarterly meeting for the prevention or control of outbreaks of Cholera was sent to the Dominion Government, Provincial Governments, municipal clerks, Health Officers, and Sanitary Inspectors.

On August 30th two hundred copies of a circular respecting the influence on health of large deposits of sawdust in streams were sent to correspondents.

On October 20th two hundred copies of a letter were mailed to American and English publishers *re* Reference Library on Public Health.

On 21st of October, a letter asking for as complete a report as possible of the sanitary condition of the municipalities of the Province, 750 in number, was sent to the municipal clerks and Health Officers.

In November, 650 copies of the Report of the Board on the prevention or mitigation of epidemic Cholera in America, were sent to the various municipal authorities. Two hundred and forty-one applications for Reports and pamphlets were received and promptly attended to.

During the year two hundred and fifty requisitions for vaccine virus were received and complied with.

Four hundred notices of formation of Local Boards were received and entered in the register.

Two hundred and twenty-one Annual Reports from Local Boards have been received and acknowledged.

Seven thousand copies of the 2nd Annual Report were sent to municipal clerks, newspapers, mechanics' institutes, public school inspectors, State and city boards of health, every medical practitioner in the Province of Ontario, several in the Province of Quebec, as well as a large number of exchanges in America and Europe. There have been also sent by mail two thousand pamphlets, "How to check Contagious Diseases"; four thousand four hundred "Sewage pamphlets"; four thousand three hundred "Cholera"; eleven hundred By-laws, Schedule A. From January to June six hundred and fifty *Health Bulletins* were sent out weekly, making a total of fourteen thousand three hundred for first six months of the year. For the last half year the *Bulletin* was issued only monthly, and a total of four thousand two hundred copies were mailed.

Twenty-seven secretaries of State Boards of Health, as also secretaries of City Boards, were supplied with the circular issued by Ontario Board on School Hygiene.

One hundred and sixty-eight medical correspondents of the Board were supplied with forms for making weekly returns of diseases, four times during the year. Sixteen medical men in District No. 9 were requested to become correspondents of the Board; eight in district No. 8; nine in district No. 7.

An average of forty Reports per week recording the prevalence of disease were received from our medical correspondents. These were compiled for the *Weekly Bulletin*, and finally put in a more extended form for the Annual Report.

One thousand one hundred and seventy circulars, with answers contained therein, on School Hygiene, were received and compiled from twenty-one counties.

Three hundred and twelve letters were received, filed and entered in register.

Fifty Reports in reply to the enquiries on sawdust nuisance circular received, and a synopsis made of them.

One hundred and fifteen replies to circular *re* Sanitary Condition of Municipalities were received and tabulated.

The foregoing details may suffice for exemplifying the additional amount of work that has accrued since the new Health Act came into operation, and should it unfortunately happen that during the coming summer this country should have a Cholera visitation a further increase would naturally follow. That such a visitation may not

fairly be considered as an uncalled-for assumption the following grounds may be adduced: Fair reason for believing that the purity of water supply, both in cities and towns, is open to question, and that the prevalence of Typhoid may be viewed as a true index of the risk of this disease; that we cannot consider ourselves proof against the latter until we have banished the former. Rome, with its pure water supply, has escaped, Paris might probably have been equally free but for a temporary supply of highly polluted water; while Naples owed its lamentable losses to a soil impregnated with sewage, to its filthy habitations and foul water. Dr. Blaxall, in his report to the Local Government Board for 1882 on Emigration and Immigration, shows that as regards disease prevention, notwithstanding all that has hitherto been done, matters are still unsatisfactory, and that infectious diseases frequently follow in the wake of emigrants from one port to another, and are by them introduced on board ship. With but few exceptions no steps are taken to prevent this latter catastrophe. If the passengers exceed fifty in number they are required to undergo an examination by an officer of the Board of Trade when at the point of leaving the country, but there seems to be no adequate provision for dealing with the case of emigrants coming from the continent to embark in English ships when the infection has declared itself, and until it has declared itself there appears to be nothing to prevent a person mixing with others, and by infected clothing spreading the disease wherever he goes. Dr. Blaxall considers that there is very great need for a better regulation of the passenger traffic, so as to protect the public, the emigrants, and other countries against the spread of infectious diseases. We have then, reason to fear, that unless greater precautions are taken at ports of departure of emigrant ships from Europe to this continent, the germs of the disease not yet extinct may be imported to our shores, and as a necessary consequence a larger amount of additional work by the Board will be called for.

PART I.

CHAPTER I.

THE PUBLIC HEALTH ACT, 1884, AND ITS INFLUENCE UPON SANITARY WORK IN ONTARIO.

As the general public are aware, the scheme which the experience of the Provincial Board of Health, during the first two years of its existence, had proved desirable for the collecting of all sanitary enactments, contained in Provincial Statutes and passed from time to time, as occasion demanded, into one consolidated Act, and for modifying or adding to them what was necessary for effective health work, was carried out by the passing of an Act during the session of the Legislature of 1884, to make further provisions respecting the public health. This Act, which embodies a large proportion of the recommendations which the Board, after much laborious consideration of the needs of the Province, and of the measures which had been taken in Great Britain and elsewhere to supply similar needs, has been such as to supply to the Board a base for operations, the good results of which, even in the short time the Act has been in force, will, it is hoped, be amply illustrated in the pages of this report.

1. *The Uniformity of the Plan for Public Health Work.*—In a work which undertakes to deal with almost every phase of society's existence—with the rearing and education of its children, with the home life, as dependent upon the food and drink, the clothing, the heating and ventilation of houses, the disposal of refuse and excreta, with local sanitation as regards public water supplies, pollution of streams, the regulation of industries which may be injurious to the public health, with the restriction and stamping out of infectious diseases, with healthful methods of public education, and many other equally important problems—it will be apparent that, in so far as is possible, systematic action is necessary, and that this must be dependent upon the adoption of legislation giving a unity and strength to the system. This, it was hoped, and experience has proved it in a large measure true, has been given by the Act. After defining some of the more important terms with which health legislation has to deal, Part I. of this Act defines the ordinary powers, and the special, viz., the powers of the Provincial Board during the prevalence, or threatened prevalence, of *any formidable* epidemic, and the special duties then laid upon local authorities. Part II. of the Act thereafter proceeds to discuss the organization of Local Boards, for the performance of the *ordinary* health duties of every municipality; and Part III. points out very succinctly what these duties are. The methods of procedure on the part of Local Boards, in regard to nuisances and local unsanitary conditions, as respects trades which may be injurious to the health, for establishing systems of public water supply, for dealing with unsound articles of food, to limit infectious diseases, by disinfection, isolation, etc., are all set forth in regular order; while the process by which a Local Board causes obedience to its orders, and the penalty for a violation of the provisions of the Act, are equally well defined. To the Act is appended a schedule in which the details of a comprehensive health by-law, for adoption by municipal councils, are given. From this summary it is apparent, that not only are health matters set forth as a part of municipal work as distinct as is municipal educational work, but, also, that provision is made whereby such special work is to be carried on by a Board, appointed and, presumably, well fitted for its performance. Further, inasmuch as many matters arise of such difficulty as to give Local Boards much

trouble in arranging them, the plan provides for reference to a central authority, with special powers to act in such matters, much in the same manner as the central school authorities have executive relations in connection with the various schools of the Province.

2. *The Principles Underlying the Plan.*—We think that all will be inclined to go at least as far as a modern writer of very democratic tendencies, Henry George, on the Province of Government, when he says:—"Government should be repressive no further than is necessary to secure liberty, by protecting the equal rights of each from aggression on the part of others." A careful study of the provisions of the Act must make it appear evident that, if this point in health legislation has been reached, it certainly has not been exceeded. It has been common to say that *health laws are always tyrannical*; but, from a sociological standpoint, the provisions of this Act are tyrannical only towards the offenders against the rights of others. It is based upon the axiom, "that it is the business of Government to do for the mass of individuals those things which cannot be done, or cannot be so well done, by individual action." This will be seen by examining any single provision of the Act. Take, for instance, the first executive provision relating to Local Boards: "It shall be the duty of every Local Board of Health to cause to be made, from time to time, inspection of its district, in order to prevent the accumulation within the district of any dirt, filth, or other thing which may endanger the public health." Were every citizen capable and willing to prevent such accumulations, it would become unnecessary for any such regulation; but it is a fact, patent to all, that in many cases people are not willing to take the trouble to prevent them; and further, it is readily seen that scavenging, for instance, can be better and much more economically done under municipal management, than by individual citizens. But following the bearing of this provision for protecting the public health a little further, we will see how widespread is its application. Such accumulations as house refuse, refuse from tanneries, piggeries, etc., become offensive from an æsthetic standpoint; they pollute public water supplies, and are the materials favouring the propagation, of epidemic disease; and, finally, they affect the rights of others by depreciating, in the case of offensive trades, the value of property.

Any other provision of the Act may, it is confidently asserted, be defended on the same ground as the foregoing. Regarding the plan as already outlined, whereby authority, starting with the municipal government, passes by degrees, according to the difficulties or magnitude of the case, to the general government, it has been made apparent that distinctive work is set apart for each, from the individual citizen, the municipal board, the government board, up to the Government itself. The good to the individual and the state, through the preservation of health and life, is mutual, and the work for the attainment of this end must be general and common to both.

3. *Some of the more Important Provisions of the Act.*—Of the provisions of the Act, there is one of extensive importance from a public health standpoint, viz., the one already referred to, by which the Provincial Board of Health, subject to the approval of the Lieutenant-Governor, may issue regulations for the prevention, as far as possible, or the investigation of disease. Such a power, granted formerly to a Central Board by proclamation of the Lieutenant-Governor, but seldom resorted to owing to the depressing effects of such proclamations upon trade and public sentiment, is now a part of the routine work of the Provincial Board; and during the past summer it was acted upon to the extent deemed equal to the degree of danger of Cholera being introduced through some Canadian or American port. All parts of the country, instead of being alarmed, were reassured as to the public safety, and felt that the Government was prepared to act against anything greatly menacing the public health. The response to the action of the Provincial Board at that time was, from all important centres of population, prompt and largely satisfactory; but in this particular, it is necessary for all to remember that the public danger is not past, and that increased energy of local action is still imperative, before the country can feel itself prepared to cope with the outbreak of such a disease should it occur during the coming year. In connection with outbreaks of diseases, such as Cholera, just referred to, or, what will occur much more frequently, of Diphtheria and Typhoid Fever, Section 11 of the Act contains an important provision, by which the Board is authorized to send its "Secretary or any member or members of the Board, to

investigate the cause or causes of any contagious, or other disease or mortality." This provision, which is also contained in the Act establishing a Provincial Board, has been exercised on a goodly number of occasions, and in all cases much information and good has been the result; but owing to the limited opportunities and time of the officers of the Board, and their inability to follow up the investigations by personal assurances that sanitary remedies suggested have been carried out in a thorough and systematic manner, this branch of the work, to which is attached the opportunity for organizing the Local Boards for better work, has not attained that position which, in the view of the Board, its importance deserves.

One of the various clauses of Part II. viz., Section 12, contains provisions which are a great step in advance of previous legislation. The compulsory formation of Local Boards was a *desideratum*, the attainment of which has enabled the Provincial Board to push local sanitation to a degree hitherto quite impossible. Its progress will be referred to at length in Chapter II.

The first clause under Part III., by which the work of the Local Boards is left entirely at the mercy of the Municipal Council, by virtue of the latter voting or not voting such sums of money as the Local Board may deem necessary for carrying on its work, has, as was expected, been a great hindrance to local work. Various and numerous instances have occurred where councils have absolutely refused to advance any money for health purposes to Local Boards. Probably the most glaring abuse of power in this regard, on the part of Municipal Councils, has been in the capital of the Province, where the total amount of money actually at the command of the Board was $500 for the sanitary needs of a population of nearly 100,000! Such facts point to the necessity for such a change as will enable Boards to be supplied with sufficient funds for carrying on their work, accompanied with, as a consequence, a direct responsibility to the ratepayers for its proper use, as is the case with the School Boards. Assuming, however, as in some instances is the case, that Boards have been authorized to engage in executive work, with the assurance that any expenses incurred will be borne by the Council, we find in Section 23 power given Boards to order, and see that the ratepayers carry out such necessary health work as is required of them. Sections 26 and 27 define the manner by which such performance can be enforced. Section 28, etc., indicate clearly the work which the Boards are expected to perform, such as the abatement of nuisances, or such unsanitary conditions as may endanger the public health, whether within their own or contiguous municipalities. As many cases are likely to arise, and have arisen within the year, of much difficulty, owing to the various opinions which may be held as to how they should be remedied, and because they would affect important interests, Secs. 36, etc., provide that local authorities may apply to the Provincial Board to investigate these matters, and lend their experience and influence to having them equitably settled. As will be seen in subsequent chapters, the work thus thrown upon the Provincial Board is often of the most difficult and intricate character, calling for, on their part, much minute investigation and consideration of how best to advance the public health with, at the same time, the greatest regard for private rights and vested interests.

Sections 38, 39, 40, deal with the important duties of Local Boards in securing good water and good food, and for adopting sanitary methods for the disposal of excreta and house and barn refuse. Sections 41, etc., provide for the restriction of infectious diseases on the part of Local Boards and their Medical Health officers, by requiring householders and medical men in attendance on such cases to report their existence to the Board, who are expected to have provided medical men with blank forms for reporting. This, we are happy to say, has been inaugurated and is being carried out in many municipalities. Municipalities under these sections are also required to provide hospitals for the reception of persons affected, whose conditions are likely to make them sources of public danger through spreading the disease. Provision is further made for the disinfection of infected clothing, and the protection of the public against infection from travelling in vehicles by heavy penalties imposed upon those who remove or sell infected clothing or other articles, or who shall knowingly carry infected persons in carriages, etc. Sections 65, etc., contain the penalties which are to be inflicted for neglect or violation of the provisions of the Act. Such are the general provisions of the Act. Based on this is

Schedule A appended to it, and which, unless altered or repealed, becomes the by-law of every municipality. The clauses of the by-law are most comprehensive, and have in but few instances been materially amended by municipalities; and the Board feels that where local authorities see that the provisions of the by-law are carried out there will be little to be desired in the conditions of the local health. Action under many of the clauses has, in numerous instances, been taken, and it is believed that the various subjects referred to in them will gradually come under the attention of Local Boards.

4. *Comparison of the Results with those of Last Year.*—Section 13 of the Act provides that the appointment of Local Boards under the new Act take place at the first meeting of the Municipal Council in May, and that Schedule A, unless amended or repealed, becomes municipal law after the first day of July, 1884. It thus appears that the operation of the Act has not been for a greater period than six months. With so short a period for the working of the Act it would be as manifestly unfair to expect too much as it would be to dilate too largely on the good results attained. We may, nevertheless, indicate some of the points wherein this Board and its associated Local Boards stand in much improved positions respecting their ability to get sanitary work accomplished. Instead of the Provincial Board being now able, as previously, to only point out to Municipal Councils the desirability of their appointing Local Boards they can now refer them to the clause of the Act requiring them to appoint Local Boards, and also to Section 19, informing them of the powers of the Provincial Board to appoint Local Boards in case of their neglect. As will be seen in Cap. II., the effect of this clause has been to have more than six times as many Local Boards in existence to-day as a year ago. But this point, as will have been gathered from the review of the provisions of the Act, is followed up by clearly defined methods of procedure on the part of Local Boards, which formerly had been a great obstacle to effective work. Reference to the Provincial Board, in cases of difficulty, is now perfectly understood, and the latter has now certain well-defined executive powers, which make the facilities for seeing that real work is done in the municipalities, many and real. Before the Act it was impossible for the Provincial Board to obtain any accurate information of the local condition of health work. Now, as will be seen subsequently, Annual Reports are received from Local Boards in all parts of the Province, and a fair index of progress is thus obtained. Local authorities, now aware of their powers, have in a number of cases prosecuted under clauses of the Act, and the reading of the law has been so clear that verdicts against offenders have been obtained and remedies have been effected. Previously the method of procedure was uncertain, and conviction was difficult of attainment. Last year any local sewage or water supply schemes instituted were carried out without any reference to the Provincial Board. Now the method is easy by which local authorities can refer their schemes to it and obtain suggestions which are likely to make improvements in defective schemes. Last year, although under the Act of 1882, the reporting of infectious disease was made compulsory, yet the anomaly existed of there being in most cases no board by whom information would be received. Finally, the process has been made easy by which the Provincial Board can establish a complete system for receiving information, giving instructions, and seeing that they are carried out during periods of extended invasions of infectious diseases. If much remains to be accomplished, it is nevertheless true that much has been gained, and that the new Health Act has given an impetus to public health, which, under old conditions, would have never been possible.

5. *Comparison of the Plan with Other American Systems.*—In Cap. VII. of the Second Annual Report of the Board, a somewhat extended comparison was made of the defect in Ontario Health Legislation, by a comparison with two of the most complete existing systems, viz., that of Great Britain and that of the State of New York. In the latter the formation of Local Boards, under an Act of 1881, was made compulsory, and these Boards were to be triennial. Such is the law also in England, with regard to the number of Local Government District Boards. In the former most of the members hold office, *ex-officio*, being the Mayor, Clerk and Justices of the Peace, with a citizen member appointed by them; in the latter the members are elected by the ratepayers, and have the power of levying assessments for health purposes. In New York it

is the duty of the Council to provide funds for the operations of the Boards. In two respects it must be conceded that the Act of 1884 falls short of both of those mentioned in two particulars, viz., that the members of Boards in both cases hold office for three years, and that in both, power for obtaining funds are given, notably that of England.

Experience has already proved that, in Ontario, effective work will depend on some such amendments being made to the Act of 1884. Excepting these two examples, Ontario has nothing to fear by a comparison of her Health Act with that of any American State. Michigan has an old and, in many ways, a very active State health organization, but the powers of the State Board in regard to local health matters are (New York 1882 Report) apparently of a wholly advisory character, while the old difficulty regarding executive action apparently exists there, of the Local Board being simply the municipal council, (or a committee of it), and that the expenses of any health work performed by them, are defrayed from township funds. The evils of this method, in practice, were referred to fully in Cap. VII., Report of 1883, and the advantages of the English and the New York systems were also pointed out. From the principles underlying the Michigan State Board organization, as enunciated by the Secretary, Dr. H. B. Baker, in a paper read before the American Social Science Association in 1882, it would appear that the Board has no power to deal directly with the question of preventing the introduction of contagious diseases, or for exercising administrative powers for suppressing them when introduced. In Illinois there is an entirely different system in existence since the Secretary of the State Board acts practically as a State Commissioner of Health. He has very extended administrative functions, not by any means confined to sanitary matters, since he is likewise the chief functionary for regulating the practice of medicine in the State. He has power to prevent the entrance, even into the State, of vessels or railway trains suspected of, or actually conveying persons having infectious diseases. The work of local organization does not, however, seem to have been advanced to the same extent as in Michigan. The State Boards of eastern States have, in most cases, other than sanitary powers attached to them. That of New Jersey has a secretary whose work also deals with epidemic diseases of animals. Local sanitary work is conducted on the permissive plan of Committees of the Council being Officers of Health. The New Hampshire Board is constituted on much the same plan, but has, in addition, control of registration of births, marriages and deaths. This is similarly true of the New York, Rhode Island and Connecticut Boards. In the two latter sanitary work, on the part of the State Board, is mostly of an advisory character, and occupied with carrying out investigations into out-breaks of epidemic disease. The Massachusetts State Board, which in past years has given the greatest impetus to State medicine of any organization in the United States, undertook and carried out for ten years sanitary reforms, with a thoroughness allied in some degree to that which obtains in Great Britain; but through the political changes incident to the American system, it underwent a metamorphosis, and has lost most of its old efficiency by being merged into the Board of Health, Lunacy and Charity. From this brief review of the more notable of the American Health Organizations, it will appear that the Ontario Sanitary Code, will compare favourably with that of any State, and with one or two exceptions, it is superior, in its having succeeded in intimately associating the Provincial with the Local Health organizations; and, while its relations with the latter are largely of an advisory character, yet there are circumstances in which the Provincial Board may step in and strengthen the hands of Local Boards, or, in some cases, protect the local health, should municipal authorities prove neglectful of their onerous duties. Regarding its protective powers over the Province at large, against dangers from the introduction of infectious disease, its powers are, as they should be, extensive, and in many matters with the sanction of the Lieutenant-Governor, absolute.

CHAPTER II.

MUNICIPAL HEALTH WORK UNDER THE NEW ACT.

1. *Work of Local Health Organization.*—In referring to the work done by Local Boards of Health since the passage of the Public Health Act, 1884, which became the law of the Province on the 1st of May, 1884, it must be borne in mind that it took some time for the various municipalities of the Province to be made aware of the existence of such an Act. Copies of the Act were forwarded to all the clerks of townships, villages, towns and cities in Ontario, accompanied by a circular calling their attention to the provisions contained in it and the advisability of at once bringing the question of the formation of Local Boards of Health before their respective Councils. A large number of municipalities cordially responded to this call, and in a short time the Provincial Board had the pleasure of receiving intelligence of Local Boards being formed in all directions. It is true that some were apathetic in the work, while others have not yet taken advantage of the powers conferred on Municipal Councils by the Public Health Act, and for some cause or pretext have not yet established Local Health Organizations. This, of course, is a violation of the provisions of the Act and the delinquent Municipal Councils have been made aware of this fact by circular, and many of them by private letter, urging them to comply with said provisions and form Local Health Boards at once. In reply, some letters have been received from clerks stating that owing to the good sanitary condition of their respective districts, and the excellent health of the inhabitants, their Councils did not think it necessary to go through the form of appointing Local Boards. This excuse was met by the Secretary, who explained that, in the first place it was their duty to obey the law, and that although good health and sanitary conditions are now happily in existence amongst them, yet it is well to be always on the watch, since some insidious disease might at any moment break out, and, finding them unprepared with organized methods for combating it, would destroy many valuable lives which might be saved to the community by the wise exercise of those precautionary measures which are taken by all active health organizations. From the many letters promising strict conformity with the Act at an early date, which have been lately received, it is confidently anticipated that in the early part of 1885, all those municipalities whose Councils have not yet appointed Boards, will fall into line with those who have already taken advantage of the salutary provisions of the Public Health Act for the formation of Local Health Organizations.

The work which has been performed by many of the Local Health Boards now established has been very onerous and singularly well carried out. Their officers have evinced a most creditable interest in the prosecution of needed sanitary reforms, and have, in many instances, shown a wide knowledge of the meaning of the Act; whilst a few who were not quite sure of the bearing of some of its clauses, have written for information to the Secretary of this Board. When we consider the short time—only a few months—since the Act was passed, it is a subject for congratulation to know the amount of good work performed, and the preventive measures taken for lessening disease by the Local Boards of Health now established throughout the Province.

2. *Reports of Local Sanitary Conditions.*—The Secretary has received 221 Annual Reports from Clerks of various Municipalities in the Province, the great majority of whom state that their districts are in a comparatively good sanitary condition. Very many nuisances were in existence before the Local Boards were formed, which have since been removed and steps taken to prevent their recurrence. In a few municipalities, Diphtheria, Small-pox and Typhoid made their appearance, but owing to the prompt action of the local health authorities, especially where there are Medical Health Officers, these diseases were isolated and prevented from spreading. This in itself shows the great necessity there is

for Local Health Boards being formed, as the concentrated and prompt action of these members can prevent an epidemic of disease; whereas in those places where no such Boards exist, panic is the result when epidemic disease makes its appearance, the people not knowing how to act together so as to render effective service to the sufferers, and to keep the disease within existing limits Too late it may strike the council of such municipalities that they have been somewhat remiss in their duties. It has frequently happened that the council has then taken action and formed a Board which, properly organized, has been able to effect great good; but how much better it would have been had such a Board been formed before the visitation of disease. The recent outbreak of Small pox in Hungerford will amply illustrate this remark: Here as in many other cases the feeling previous to the outbreak was that owing to the health of the people being so good it was unnecessary to form a Local Board. When Small-pox made its appearance, no preparations having been made to resist and conquer it, it spread rapidly, until in a very short time sad havoc was made amongst the people. At the very outset a panic ensued, as a natural result of the absence of a health organization, and the Provincial Board of Health had to step in and endeavour to remedy evils due to the neglect of the local authorities; and by its unremitting efforts in having a Local Board of Health appointed, vaccination and re-vaccination practised, inspectors and constables detailed to secure isolation, the disease was practically eradicated from the township, but only after the loss of many lives.

On the other hand, numerous instances might be given to show the good results of careful and systematic looking after the sanitary conditions of districts presided over by Local Health Boards; but space being limited we have only to say, that of the many reports received by the Secretary of this Board from Local Boards of Health throughout the Province, regarding the sanitary conditions of their respective districts, a large majority of them show that sanitation is receiving great attention at the hands of Local Health authorities. They now realize that an unsanitary condition begets disease, and they appear to be determined to do their utmost to eradicate the cause of so much sorrow, misery and expense to the inhabitants.

3. *Progress of Local Sanitary Improvement.*—Prior to the passage of the Public Health Act, 1884, there were few properly so-called Local Boards of Health in Ontario. True, there were Committees of Councils appointed in a few places to look after the public health, but as there was really no scientific method determined on or carried out for the prevention or treatment of disease, whether of an endemic or epidemic character, nor any sanitary by-law thoroughly enforced, the government saw the necessity of legislation on the subject, and hence the Act, which came into force on the 1st of May, 1884. Over 400 Local Boards of Health have been formed in the Province since that time, or more particularly since the 1st of June—because a month at least elapsed before the different municipalities became cognizant of the provisions of the Act, and they could not move in the matter sooner. That is to say, in the short space of seven months, nearly two-thirds of all the municipalities have conformed with the law, and three-fourths of the people are under sanitary supervision, and from the reports of sanitary conditions received from the secretaries of Local Boards, it is at once seen how rapidly progressive is the work done in a large majority of cases. House to house visitations have been made by the officers of the Boards, and when anything in the form of a nuisance has been seen, steps have been at once taken to have it either abated or removed, according to its character. In many municipalities slaughter-houses have been visited and if they have been found to be in such a condition as to be injurious to the public health, their owners were forthwith served with notices to have the nuisance at once attended to. Proper systems of drainage have received much consideration at the hands of Local Health authorities. The wells attached to the dwellings in some municipalities, where at present there is no water works system, have received a share of the special notice of Boards, and when situated in dangerous proximity to out-houses, from which they were liable to be contaminated, measures have been taken to prevent this by having the wells closed and new ones dug in positions where such contamination would not be possible. Where this has been done the results must necessarily have been most favourable to the health of those having to use the water. It is a well-known fact that impure water is the cause of many diseases of a

serious nature. Whilst, however, it is our pleasureable duty to bear testimony to the many praiseworthy and effective efforts made by Local Boards of Health in various municipalities, we regret exceedingly that in others there has been a great want of attention to this as well as other matters, and bad, unwholesome water, with nuisances of a domestic as well as of a public character, are still to be met with even in municipalities where there are Local Health Boards. This state of affairs should not be allowed to exist, if a desire to save health and life actuates those having charge of both. There is another point which deserves notice and it is, that in municipalities where there are Medical Health Officers and Sanitary Inspectors in connection with the Local Boards of Health, a much greater improvement is perceptible. We are sorry, however, to have to record the fact, that of those 400 Local Boards of Health formed throughout the Province, only 65 have Medical Health Officers, and 96 have Sanitary Inspectors. The great apparent cause of this state of affairs is the *expense* of such appointments. Officers in such positions cannot be expected to work for nothing, nor to give their valuable time and run many risks of taking disease without being recompensed for their labour. But it looks as if some municipal councils think more of a few dollars than of the lives of the inhabitants, and as if they imagine that by saving expenses for the time—and only for the time— a great favour is being conferred on the ratepayers in lessening by so much the amount of their taxes. The very fact of its being demonstrated that where these officers are appointed an amount of sanitary work has been performed creditable in the extreme, ought to be sufficient incentive to councils who have not made such appointments to do so at once, and they will in a very short time reap the advantage of adopting a course at once beneficial and, in the end, highly economical to the inhabitants. Notwithstanding this oversight on the part of a large number of municipalities, we cannot but feel much rejoiced at the very marked improvement which has taken place in sanitary matters since the passing of the Public Health Act, 1884. The question of sanitary reform is taking a strong hold not only of Local Boards of Health, but also of the inhabitants, whose co-operation with the Boards will cause the powers of the latter under the Act to be more effective in future, and the benefits conferred by sanitary science properly applied by them, will be cause for heart-felt congratulations of the people.

4. *Local Sanitary Needs, and Suggestions for Further Improvement of Local Health Work.*—There are a number of needs which experience has shown to be imperative, if local Health Organizations are to perform effective work.

(a) The Appointment of Sanitary Officers.—Section 20, Public Health Act, 1884, gives the Municipal Council power to appoint a Medical Health Officer and Sanitary Inspector or Inspectors. This is the first essential to active sanitary work. The necessity for a Medical Health Officer is due to the fact, that sanitary work is evidently a scientific work, dependent upon a knowledge of a class of facts which medical men from their profession are more likely than others to possess. Knowing in a larger degree than others the causes of disease, they are most likely to suggest the readiest and most practical ways for carrying out public health work. From their daily practice and rounds in various communities, they are most conversant with sanitary conditions and needs. They are the first to detect epidemic disease, and hence are in the best position to advise Local Boards of the necessity for immediate action, and to indicate the direction in which their energies are to be exerted. This being the case it would naturally follow, as it actually does, that they are in most instances the first persons to agitate for sanitary reform. Very many of the Boards formed have medical men as members, while, as already mentioned, some sixty-five Medical Health Officers were appointed in 1884. But, while the strength of a Board is greatly augmented by the presence in it of a medical practitioner, it is readily understood that his many other duties, as well as feelings of delicacy, make it unlikely that he will be as active in the public service, as if he were the regularly appointed Medical Health Officer. He is, if legally appointed Medical Health Officer by the Council, placed in a position in which, by virtue of his office, much power and extensive duties are assigned to him. This being the case, it is natural that the Council in looking for the performance of such duties, should fix upon some remuneration for services rendered. In some cases this has been done, while in others medical men have acted in

the public interest without pay from philanthropic motives, and for the sake of having their own districts stand favourably in the eyes of the public; since nothing can be more certain than the fact, that *good public health* has an actual financial value in the market. But, inasmuch as this latter method lacks in those business qualities essential to any well-executed work, it seems desirable that some means be adopted by which Medical Health Officers should be appointed under compulsion, and that some *per capita* basis be established for their payment. Whatever doubt there may be concerning the expediency of this under the ordinary conditions of the health of the Province, there can be none under the exceptional conditions of the presence of contagious disease of epidemic prevalence. If it be not thought desirable that a clause should be inserted in the Act, making it compulsory on all Municipal Councils to provide for the appointment of a Medical Health Officer, there can be no difference of opinion regarding the desirability of giving to the Provincial Board, with the sanction of the Minister of the Department, the power of saying where such a duty shall be imposed upon a Municipal Council, and of stating, when required, what the rate of remuneration of the Medical Health Officer should be.

The appointment of Sanitary Inspectors can be considered only second in importance to Medical Health Officers. It is quite obvious that no sanitary system, however well it may be planned, will be of practical service unless its provisions are carried out; and there must be some person to carry into execution the orders of the Medical Health Officer, and the provisions of the sanitary Acts and By-laws. Such executive works it should be the duty of the Sanitary Inspector to perform, as well as to see what abuses or unsanitary conditions exist and report them to the Medical Health Officer when necessary. His work to be effective must be constant, unremitting and systematic. His is a work which, bringing him often into antagonism with individual ignorance, personal neglect, and private interests, must of necessity here and there initiate and create a hostility toward him personally, as the officer is too frequently confounded with the office; hence, requiring tact, intelligence and character, the work ought never to be delegated to any person not possessing these qualities, and anyone possessing them deserves and will require to be properly paid.

(b) An Annual Grant for Sanitary Work.—Doubtless this is the pre-requisite of all effective health work. War cannot long be waged without the sinews of war. It would seem idle in some instances, as those of new, sparsely-settled and poor townships, to expect much to be done in this direction, when we are told that school and other expenses already make the taxation which would be required, more than two cents in the dollar on the assessed value of property. Dire necessity, as in the case of Small-pox and Cholera, could alone make this possible; but, fortunately, the very sparseness of population makes the necessity less. In the vast majority of municipalities, however, this will not prevail: and it will simply require the steady advance of intelligence, teaching that appropriations for public health work are a wise economy, in order to have the grant made annually with as much regularity as it is made for school purposes. Regarding such grants in cases of emergency, experience during the past year has taught the necessity for having an amendment to the Health Act, by which adequate machinery shall be provided for the enforcement of certain existing clauses of the Act, requiring municipal corporations to supply necessary funds for limiting or suppressing epidemics.

When officers and funds approaching the amount necessary for effective work, have been supplied to Local Boards we may fairly expect to find the many other manifest needs supplied in proportion. Some of these have been time and again pointed out.

(c) The Sanitary Inspector or Inspectors should make a systematic and thorough examination of the district, on some such plan as that set forth by the Provincial Board in the Inspector's book, a copy of which was supplied to each municipality during the year. Such inspections having been made, the remedying of unsanitary conditions found existing would follow his directions, if not voluntarily then they would be insisted on by using the coercive powers of the Act.

(d) Among the most urgent needs in most, if not all, large municipalities is the passage and enforcement of a by-law providing that the plans of all buildings about to be erected, be referred to the Board or its officers in order that no unsanitary conditions be

permitted. This, which seems at first a somewhat harsh measure, can in no sense be considered so, when it is remembered that the municipality insists on it for the protection of any of its citizens who may occupy such buildings. If it be asserted that often the builder is not to be the occupant, then in the name of all that is just and decent, the builder should be just as willing to protect tenants as himself, and should be compelled to do so. It is intolerable to think that the poor, who are unable to erect houses of their own, and who are often forced to remain in houses in a disgraceful sanitary condition, because they do not know where to find better, or are unable even to obtain funds for the necessary moving from place to place, should be left, as at present, absolutely helpless in this matter. The inspection of the house in course of erection follows as a necessary corollary to such a law, and there is no hardship to the owner involved in the matter.

(e) The last to be mentioned, while leaving many other important matters untouched, are the needs for some more organized methods for the removal of excreta. In season and out of season, this has been asserted by this Board, and while acknowledging that there are difficulties in the way, we must again repeat that these difficulties will rapidly disappear by systematic and methodical modes of dealing with them, such as have been recommended in the pamphlet, No. 11, published by this Board. The day is past for box drains, and drains pretending to be sewers, which in more than one town and village in Canada have been found to *run up-hill*, as also for the filthy collections which too commonly exist in our back yards.

CHAPTER III.

ACTION TAKEN REGARDING VARIOUS PUBLIC NUISANCES AND LOCAL UNSANITARY CONDITIONS, WITH RESULTS.

Although it may be difficult to give a definition of a nuisance, which shall be sufficient for all circumstances, the fact nevertheless remains that nuisances do positively exist, even as cases of insanity do, though experience has shown that there is no sufficient definition for the latter, except that it is the opposite of sanity. Chapter V. of the Second Annual Report contains what is believed to be as comprehensive a definition as it is possible to give, viz.: "A nuisance is anything which is injurious to health, or which is materially offensive to the senses, or which interferes with the enjoyment of life and property."

Experience in several cases before the courts, even within the present year, has shown how difficult it is to decide not only whether this or that condition is *injurious to the public health*, but whether it is even *materially offensive to the senses*, or interferes with the *enjoyment of life and property*.

There are very many reasons why there should be, if possible, some definite scientific meaning accepted for the term *nuisance*, which would be received without cavil by the courts, since we are persuaded that in them can never be properly settled by ill-informed though honest witnesses, or by interested or prejudiced witnesses (of whom equally great numbers can be found by both the prosecution and defence), questions which depend upon incontrovertible scientific facts, which facts are not altered one iota by all the witnesses in the world. It is perfectly manifest both from reason and experience that the senses are not to be relied upon in determining whether or not a thing is a nuisance, and yet such evidence is that which is likely to have more weight in a trial before an ordinary jury than would scientific evidence. It is well known that the senses become blunted or active in proportion not only to the degree in which they are used, but also to the nervous organization of the person using them. From a person who lives in the air of a slaughter-house to that of the savage who is known to follow a trail, guided by the sense of smell, there are an infinite number of degrees in the acuteness of that sense. Yet, in a court of law, the word of the one is neutralized by that of the other, should both be capable of testifying. Arrange between these two the mass of the people of an ordinary community, and somewhere between these we are supposed to have arrived at the normal degree of acuteness, which is to decide whether a smell is or is not materially offensive to the senses. That such can be no criterion is evidenced by the fact that those living daily under the influence of the odors from effluvium nuisances, are often found to say that they experience no disagreeable effects therefrom, though others of more delicate and sensitive organizations are rendered ill by exposure to them.

Another unfortunate circumstance in dealing with these matters before a jury is that the condition of the offending manufactory or premises at the time of trial is too often allowed to enter into the question, and, as has occurred recently, a jury is allowed to inspect premises, and on such grounds decide whether a nuisance exists or not. It may be that at such a time care will have been taken to abate the nuisance to such a degree that the condition cannot be taken as a fair sample of what is ordinarily to be found. It is plain that such methods are most imperfect, and it cannot be too strongly pointed out that certain definite and fixed principles based on scientific data should be laid down for dealing with such cases. To make the question of whether a man with senses rendered obtuse is or is not nauseated by a smell a criterion of the existence or absence of a nuisance is as crude as was trial by fire in old Saxon times, since the guilt or innocence of the accused was tested by his power to endure pain.

1. Nature of the Nuisances.—As may be naturally expected, the nuisances to be dealt with from one year to another will be somewhat similar in character; yet certain differences

will be found in some of the cases which have come under the notice of the Board this year. The principal sources of nuisances or unsanitary conditions to be briefly noticed are :

1. Cheese factories.
2. Slaughter houses.
3. Cattle byres.
4. Woollen factories.
5. Privies.
6. Artificial manure factories.
7. Mill-dams.
8. Sewage pollution of water.
9. Cemeteries.
10. Sawdust.

In various ways the air or the water or both have been polluted, and we will first make a few remarks regarding air pollution, or effluvium nuisances.

In keeping with the remarks introductory to this chapter, it is not surprising to find that effluvium nuisances, or such as are disagreeable to the sense of smell, are those against which municipal health authorities usually first proceed. What is generally demanded by the people is that the disagreeable smells be abated. The gases of decomposition in this class of nuisances produce nauseating and depressing effects, and at times serious results follow. They mostly come, therefore, within the latter part of the definition, interfering as they do with the enjoyment of life and property. Modern biological research has shown, moreover, that there are dangers more serious by far than those dependent merely upon gases of decomposition in connection with effluvium nuisances. Microscopic forms of life in infinite number may be borne on the air with the ascending gases, and finding a lodgment on the mucous membranes of the mouth and air passages, become the source of serious disease. Allied to this fact as a cause is another element of danger, due to these fermentative processes. Not only are there such emanations as sulphur and ammonium compounds borne on the air, but, from the worst forms of animal decomposition, the air seems laden also with volatile animal odours whose chemical constitution is at present imperfectly determined. These seem to act either by directly poisoning the blood of a sickly person exposed to them, or by supplying new food to the microbes flourishing in the blood, in either case producing, as experience has abundantly proven, more aggravated forms of disease than where the person is in a fresh and pure atmosphere. The same thing is seen in the hospital gangrene and other forms of septicaemia in ill-ventilated and ill-kept hospitals. In addition, however, to the offensive character of these nuisances there are other dangers attaching to them, which are disregarded because not sensibly felt by the general public, and which are due to the microbes of special diseases which find, there is reason to believe, special opportunities for their development where effluvium-producing organic materials abound. Illustrations of this are to be found in connection with Charbon, Diphtheria, Typhoid, and probably also other zymotic diseases.

With the increase of population many questions of health arise, which in earlier days seemed to have no special importance. Amongst such questions in Ontario is that of the pollution of water with organic matters.

Organic pollution is of two kinds, animal and vegetable. In Ontario vegetable pollution has been that which, owing to the large amount of forest, and the disposal of the products of saw-mills and streams, has up to the present produced the most serious results, and has led to special legislation for protecting rivers and streams from pollution by such causes. This has been done wholly in the interest of the fisheries, but there is strong presumptive evidence that serious effects upon health have resulted from the collection of sawdust and other vegetable refuse along the shores of streams and mill ponds. Whilst the effects from sawdust may grow yearly less owing to the destruction of timber, the collections of organic matters, either animal or vegetable, in mill-ponds, but especially the former, increase with a growing population in villages and towns along the streams.

1. *Cheese Factories.*—Several instances have occurred where Local Boards have been induced to take action against the owners of cheese factories for creating nuisances. Last year a complaint against a cheese factory showed the nuisance to be due to allowing the refuse whey to flow along the gutter of a village street. Containing albuminous matter, its decomposition creates a nuisance of a very pronounced character. In the case of a factory at Thamesville, the Local Board notified the tenant and also the owner to abate the nuisance, pronouncing it to be such in the following words :—"The foul stench is

unbearable and can be felt in many parts of the village, and must be abated." The tenant positively refused, and the owner failed to take any action. Upon this, the Local Board, with a praiseworthy energy, determined to effectually deal with the matter, by having the "health inspector lock up the premises and stop all work, appoint men to properly clean and disinfect the premises, and then refuse permission to allow the factory to run till all expenses incurred are paid." On communication with the Provincial Board, the local authorities were advised that the regular method of procedure under the Act was under section 35, whereby the manufacturer is liable to a penalty of $10 a day for every day on which, after notice by the Local Board, the offence is continued, and that sections 25, 26 and 27 indicate plainly the methods of enforcing the fines. This class of nuisance has been dealt with by other Boards, who have compelled the storage or removal of the whey in such manner as will keep it from creating a nuisance. That such manufactories tend to become unwholesome to those operating them, is made apparent from the reports of Dr. McNaughton (Medical Health Officer of Erin Township) and others.

2. *Slaughter-houses.*—Local Boards throughout the Province have, during the year, been much occupied with the nuisances arising from slaughter-houses. These are present in almost every village, and in every town and city, and they afford typical examples of effluvium nuisances; and, from their disagreeable odours, they are especially calculated to induce municipal action. In many instances, as will be seen in the annual reports of Local Boards, the provision of the municipal by-law, requiring slaughter-houses to be at least 200 yards from any house, have either been carried into effect, or such precautions have been insisted upon as to greatly limit the nuisance arising from them. These precautions were fully described in the last annual report of this Board. Instances where the Provincial Board has been referred to for advice are numerous, some of the more notable being those at the International Bridge and Richmond Hill. In the latter case the Local Board has shown but little regard for the public weal, if we are to judge from the inactivity displayed by it in the face of continued complaints.

The fat-rendering and bone-boiling establishments, dealt with in last year's report, have been again under notice this year. In those in the vicinity of Toronto, by the adoption of improved methods, the nuisance has been considerably lessened, while those of one or two other places are gradually being limited in their operations.

3. *Cattle-byres.*—This year has been marked by a celebrated trial, an action having been taken in the Chancery Division of the High Court of Justice by certain residents and property-owners, in the name of the Attorney-General, to restrain the nuisance caused by the cattle-byres of the Gooderham & Worts Company, Toronto.

The details of the nuisance and of the management of the byres are given in a report adopted by this Board, and published in the second annual report (pp. 231-233). These details were fully substantiated by evidence given at the trial. Many witnesses testified as to the foulness of the waters of Brown's Pond and Ashbridge's Bay, and as to the offensive nature of the effluvia. Many bore witness to the fact that sickness and general *malaise* had been produced by these causes; also that in times of illnesss windows had to be kept closed on account of the offensive smells.

In addition it was proved that the ice dealers had suffered pecuniary loss, and that much of the ice cut in Ashbridge's Bay is unfit for use. One of the counsel for the defence endeavoured to shake the witnesses on this point by appealing to their self-interest, causing them to reflect that by testifying thus they were injuring their own business; but these appeals failed of their effect, the witnesses did not swerve from their statements regarding the impurity of the ice. Some witnesses were also of opinion that the more valuable kinds of fish had been driven away by the sewage contamination. During the trial the premises were visited by the Hon. Mr. Justice Proudfoot, the presiding judge.

The plaintiffs' case occupied a week, and at the end of that time overtures were made by the defendants, and the result was the agreement which will be found recorded, as the judgment of the court, in a subsequent part of this Report. This agreement was accepted by the plaintiffs without expert advice on their part. The case promised to be a very lengthy one, especially if carried to the Supreme Court or Privy Council, as it was said would be done, and the plaintiffs had not the wherewithal to stake in the further conduct

of the case. And so the little trees have been planted, the spouts and trestle work removed, and the cost paid, but the effluvium nuisance remains, and the water is still polluted.

Besides the now famous Gooderham and Worts case, other nuisances of the same character have within the year come under the notice of the Provincial Board. One of these will be referred to in the report on the pollution of the Waterloo creek, from the drainage of a distillery running into it. The cause of the nuisance being exactly the same as that of the case just mentioned, further reference to it is not necessary.

The dairies connected with drains have in a number of instances been the subject of municipal supervision during the year. This has noticeably been the case in Toronto, but the policy of the corporation of this city in connection with the matter has been rather vacillating and inconsistent. The dangers to which the public are exposed from impure milk and from milk supplied from unclean establishments, have been frequently dilated upon in these reports, and are again referred to in the report of the Committee on Epidemics, to be found in a later part of this Report.

4. *Woollen Factories.*—Several instances of nuisances from this source have been referred to this Board. One of these is that of the Waterloo Woollen Factory, which was complained of by the Local Board of Waterloo township, as polluting the Waterloo creek which feeds a large mill-pond at Bridgeport on the Grand River, some three miles below Waterloo Village. The matter being one of difficulty owing to the many interests involved, an investigation was made by the Secretary of the Provincial Board, and the existence of the nuisance was amply proved by a number of witnesses at Bridgeport. Mr. John Shuh, President of the woollen company, stated that the scourings and dye-stuffs were allowed to run into the creek, while, as was quite evident, the mill-dam at Bridgeport caused the settling of the heavier organic material in the pond and along the creek above. Decomposition of this material during the hot weather resulted in an effluvium nuisance of a pronounced character. On the suggestion of the Secretary, Mr. Shuh introduced a system of settling-tanks into which the scourings of the wool, which contain much organic matter, are run, and in which the organic matter is allowed to settle, slaked lime being added as a precipitant. The clear water is then run off into the creek. The dye-stuffs can hardly be considered as effluvium nuisances, although they are popularly looked upon as the chief nuisance on account of the unsightly colour given by them to the water. At St. Mary's a case of a similar character occurred and was referred to this Board. The colouring of the water was the nuisance complained of. In such a case the colouring matters might injure the fish, but it cannot be said that a nuisance exists affecting the public health.

The case referred to the Provincial Board from Sarnia is somewhat different, as the dye-stuffs are emptied into the bay at a point close above that whence the public water supply is pumped. In this case it might clearly be considered a public nuisance, since many of the dye-stuffs are of an exceedingly poisonous character. With so clear a case before it, the Local Board of Health can have no valid reason for delaying action in a matter affecting so widely public health interests.

5. *Cess-pools and Privies.*—Of all the nuisances coming under the class of effluvium nuisances, these constitute the most wide-spread, although of all, the easiest of mitigation or removal. There cannot be said to be any prejudice in favour of their continuance on the ground of their being considered the best mode for the disposal of excreta; but they remain in consequence of a want of knowledge in those using them of any better means, and from that *vis inertiæ* in regard to everything which has the sanction of long custom. The By-laws of many Local Boards have provided for a systematic cleansing of privies at least once a year. This is the first step toward an improved system of disposing of excreta and securing the final abolition of privy pits and the substitution in their stead of earth closets under municipal control. Many of the annual reports of Local Boards show that many closets have been cleansed, and that in most of our larger towns the introduction of earth closets has begun. The continuance of privies and cess-pools is to be greatly deprecated from the increasing pollution of the wells, which are still in most places the source of water supply. Orders for removing closets have in some cases been issued. One of the most interesting instances during the year is that arising from the

order of the Local Board of Galt, for the removal of certain privies situated over Mill Creek, a stream flowing along the high level on the east of the town. Action was taken because this stream being dammed at various points, allowed organic matters to settle to the bottom, and water thus contaminated by fæcal matter percolating into the wells on the river levels, would be likely to cause disease. The fact appeared to be established by the rise and fall of the wells corresponding with that of the creek. Refusal to obey the order of the Local Board caused the owner of a large establishment, the privies of which are situated over the creek, to be summoned before the magistrates. He was fined, but appealed from the decision, and the appeal was argued before a full bench. The Secretary of the Provincial Board was invited to be present to support the Local Board, while expert evidence was called for the defence. Conviction was again the result, the decision being based upon the terms of Section 4, Schedule A. Largely as the result of the agitation started by this case, a By-law has, we understand, been passed by the town council, providing for the adoption of the earth-closet system for the disposal of excreta. Difficulties are constantly occurring to Local Boards in connection with this matter. A case in Uxbridge, referred to the Provincial Board, in which the house-drain of one of the largest ratepayers was allowed to empty the contents of privy vault, kitchen slops, etc., close to one of the public streets, is one of the thousand examples to be found in the villages, towns and cities of the Province, where public sewers do not exist. While the disposal of kitchen and house slops is a matter of some difficulty, there can be none about the advisability of adopting earth-closets for the disposal of solid excreta. Where some system of this kind has not been enforced grave difficulties have arisen as in the instance reported by the Health Officer of the city of Hamilton. In that city as elsewhere persons building new houses without putting in water closets have simply connected their privy vaults with the town sewers. Municipal By-laws, for providing for the satisfactory removal of excreta, would in the light of improved sanitary methods seem to be very urgently required.

7. *Artificial Manufacture of Manure.*—The utilization of night-soil has in several localities become this year the occasion of nuisance so serious as to cause action to be taken against offenders. This has been the case in the north-western suburbs of Toronto, and at Brantford where, as can be seen in the correspondence of the Board, the Local Board of Brantford Township has had to take action. The Township Board found much difficulty in dealing with the matter owing to the offender having employed the night-soil to manufacture an artificial fertilizer near a dwelling, while the waggon used for carting was washed in a creek flowing through the premises of a neighbour. It was suggested by the Provincial Board that, while the Local Board was not bound to suggest remedies while causing the nuisance to be abated, they might very well suggest that, (1) the night-soil be carted away from the city in closed carts or waggons in zinc-lined boxes or barrels, which might be readily cleansed and would not become saturated: (2) that it be taken to a field at a long distance from any house, and there at once treated with sulphuric acid, which would serve to fix the ammonia, absorb the moisture, and destroy the organic matter. Ashes might be added to the extent desired. Should the contractor neglect to carry out this method, or should it, though carried out, not prevent the nuisance, then the Board ought to take the necessary legal steps to prevent the work being carried on. After allowing the offender in the matter several weeks for adopting the suggestions of the Local Board, the latter have proceeded against him for not appearing before the magistrate to answer the charges of creating a nuisance, under Sec. 35 of the Act, which imposes a fine for every day that he continues the manufacture after the order to desist has been issued by the Board. It is much to be regretted that the Local Board has been forced by the continuance of the manufacture, to proceed to such extremes, since the active work of the city of Brantford Local Board in causing the cleansing of privies and the advocacy of *ash-closets*, has led to what ought to be a paying industry, by supplying an artificial fertilizer to farmers.

8. *Mill-dams.*—This subject was fully discussed in a paper by Dr. Arnott, read at the London Convention and published in the Second Annual Report of this Board, but a number of questions arising during the year, have again called our attention to it. The reasons why mill-dams are considered injurious to the public health are, (*a*) the fact that

from their very nature they favour the accumulation of organic debris of every kind; (*b*) from this accumulation decomposition will take place to a greater or less extent, according to the season and circumstances; (*c*) of these circumstances the principal one is that of th rising and falling of the water, due to the season and to its being used for milling purposes. The organic matter accumulating largely along the banks during high water will, with the lowering of the water level, which always takes place in the hot season, leave the organic matter, which has been reduced to a fine state of sub-division, and therefore in a condition especially favourable for decomposition, exposed to the sun's rays. The decomposition which follows under such circumstances is without doubt the cause of the intermittent and remittent fevers which are almost invariably present amongst the dwellers in the vicinity of such water, especially during August, September and October. Where these mill-ponds, situated within or below large towns or cities, receive sewage matters in addition to vegetable organic material, their detrimental influence upon the public health will naturally be greater. The great difficulty in dealing with these mill-ponds, from a sanitary standpoint, lies largely in the fact that the contamination of the atmosphere surrounding them is so general that the injurious effects from it are only occasionally noticed by the dwellers around them. Other considerations mentioned in the beginning of this chapter further explain why these sources of danger to the public health are not more fully appreciated. But assuming that the desire to remove these evils is present on the part of Local Boards of Health, much difficulty arises from the fact that personal interests are invariably involved. In most cases investments in milling property, in the construction of dams, etc., have been made at a time when no sanitary question was involved, or at any rate entertained, and when they become sources of danger to the public health the question of vested rights confronts us. It naturally follows from this that should the public interest require the removal of a dam, much public sympathy is felt for the person who would suffer thereby. When to this is added the fact that in some cases its removal would mean the loss of some industry to the municipality interested, it becomes apparent that there are few Local Boards in a position to successfully carry out what would be best for the public health. In instances in which people in one municipality are affected by mill-dams existing in another, the case is greatly complicated and the difficulty increased. From what has been said it is apparent that a question of great practical difficulty has to be dealt with. No general principle can be laid down in regard to compensation in such cases, for if the principle is once admitted, many other established industries, as fat-rendering establishments, cow-byres, etc., might with equal justice demand indemnity for their removal.

Two noteworthy instances of difficulties in connection with mill-dams have occurred during the past year. One is the case of Saunby's dam, London, and the other of a mill-dam at Teeswater. The case at London (to which allusion has already been made) is that in which the local board of London West has demanded the removal of a dam across the Thames between London West and London City. Application was made to the County Court Judge for an order for its removal, and was refused. The matter has been referred to the Provincial Board, and is still *sub judice*. The other case is that of a *jam* in the river flowing through the farm of one Hadwin, at Teeswater. Owing to the current being impeded by the jam, drift-wood and other organic debris had accumulated, and undergoing decomposition, had in the summer months created a public nuisance. The case involved several points of interest. The Local Board having decided that a nuisance existed, required Mr. Hadwin to remove the jam. To this demand he replied that the nuisance was not of his creating and refused to remove it, but expressed his willingness to allow it to be removed provided any timber in it were given to him. The jam contained some cedar of which he wished to make fence rails. The Board, on the other hand, was willing to remove the nuisance and take the timber as part payment for the expense of removal. The questions at issue being referred to the Provincial Board it was decided on legal advice that as Mr. Hadwin owned the farm on either side of the stream, which is not navigable, Mr. Hadwin was owner of the bed of the stream, and therefore responsible for the existence of the nuisance, and that the Local Board might compel him to remove the nuisance, or might itself do so and collect from him the expense of removal. The Local Board determined to remove the jam and collect expense of doing so by ordinary process

of law. This seemed to settle the difficulty when another arose in the fact that no money having been set apart by the Council for the use of the Board, the latter was unwilling to proceed with the work, as the Council was not prepared to advance money for such purpose, some members of the Council favouring Mr. Hadwin. The Act leaves the power of carrying out such work to the Council, or to the Board, when money is supplied by the Council, but makes no provision by which the Council is required to supply funds for such work. As a result of all the efforts of the Local Board their annual report shows that nothing further has been done in the matter.

9. *Sewage pollution of water.*—During the past year three places besides London have continued to occupy the attention of the Board on account of the pollution of water by the improper outfall of sewage, namely, Toronto, Hamilton, and Sarnia. The population of Toronto is now estimated at about 118,000, and the number of persons who discharge their sewage into the bay is increasing in a proportion greater than that of the mere increase in population, for a continually increasing number avail themselves of the "modern conveniences" of the water carriage or drainage system, so that the increase of pollution of the bay is greatly in excess of the increase of population; and while the bay is not land-locked, like that of Hamilton, still the accumulation of sewage in it is very large. The water front of the whole city, therefore, becomes a source of unpleasantness and of danger to the public health. Not only is the air polluted, but as the water supply pipe from the lake is laid on the bottom of the bay leaks may at any time contaminate with sewage the city water. In view of these facts a trunk sewer along the whole city front becomes a pressing necessity. The method of disposal of this sewage has been and is being extensively discussed. The same question of sewage disposal has interested the sanitarians in Hamilton during the past year. Among the various suggestions a scheme has been proposed whereby a series of tanks would be placed at the ends of main sewers, for the reception of the sewage and its upward filtration through coal cinders and earth, thereby purifying it before allowing it to pass into the waters of the bay. The scheme when last heard of was lacking in many practical details, but the principle has much to recommend it.

The discharge of sewers and private drains above the point where the water is pumped from the bay at Sarnia is a question admitting of easy solution. It was recommended by the Board more than two years ago that a trunk sewer should be built to carry all the sewage of the town to a point some distance below, there pouring its sewage into the rapid-flowing river St. Clair. This would be a complete solution of the difficulty. In view of the dangers of the existing method it is to be hoped the Local Board will have sufficient influence during the coming year to carry out this scheme, which it does not hitherto seem to have been able to do.

10. *Cemeteries.*—Another of the sources of danger to the public health, increasing with the increase in age and population of towns, is the presence of cemeteries so close to habitations that drainage from them may contaminate drinking water. In the replies received by this Board to a circular containing a question relating to this matter, sent out to Local Boards in the 203 cities, towns, and villages, and discussed in another part of this report, it appears that in some cases grave-yards are within a few yards of wells. The following quotation from a letter regarding a case referred to the Provincial Board is but an example of many which might be given:

"The population of our village is about 1,100; the grave-yard is facing on the main street in the most populous part of the village, within 100 yards of the post-office and the principal hotel. The ground and natural drainage is to the river, which is separated from the yard by a narrow street, also one of the principal thoroughfares."

In this instance the church authorities had been requested by the Local Board to desist from further burials, but had persisted in what they deemed their rights. The case having been submitted to the Provincial Board, legal opinion obtained was to the effect that burials could be prevented by a special by-law passed by the Council, under the Consolidated Municipal Act, 46 Vic., cap. 18, sec. 496, sub-sec. 14; but in this case, as in that of the Teeswater matter already referred to, the reeve and council would not

act in the matter. In view of the dangers which may arise from the continued burying in cemeteries in such positions, it would seem very desirable that legislation dealing with the matter be asked for at an early date.

11. *Sawdust.*—During the past year, as during the two previous ones, several references have been made to the Provincial Board regarding sawdust deposits. The views of the Board upon the subject have been already set forth to some extent. A great deal of information on the subject has been collected through replies to a circular; and a special report by the Secretary, to be found in the Appendices, serves to show that where deposits of sawdust occur along the shores of streams, but more especially on those of bays and ponds, and undergo fermentation and decay, malarial diseases and other results injurious to health, have very frequently followed. There are several difficulties in dealing practically with sawdust deposits. Primarily these are due to the perfect harmlessness of the sawdust when first deposited. In the early history of the settlement of any district, the saw-mill commonly becomes the nucleus of a village, the villagers being those engaged about the mill. The sawdust serves a very useful purpose in levelling roads, filling up hollows, etc., and as it is a deposit rather pleasant than otherwise, it is little wonder that an article serving so many useful purposes is thus so conveniently disposed of. The next stage of the process is where, most of the surroundings having been levelled, the sawdust is cast upon the bank of the stream or bay where the mill is situated. From this most of the future trouble arises. In most cases it is after the trouble has been created, the sawdust of past years having begun to decay, that its prevention is talked of. The mill-owners being the arbiters of the future of the little village, often living at some distance from it, refuse to see the dangers to health present, and of course are disinclined to do anything which imposes any new expense upon an industry often depressed from over-production. There are two remedies, however, which meet the difficulty arising from these deposits. One is incidental to the value of the industry. From year to year the mill becomes less profitable as the timber of the neighbourhood disappears. In the case of the small mills, which at one time were to be seen everywhere in Ontario, their operations in old-settled communities are practically finished, and nature is gradually restoring the sawdust to humus. Even the large mills in the lumbering districts proper will soon be lessening their operations, as the large proportion of pine south of the Laurentian water-shed in Old Ontario has now been consumed; moreover, some of them have through the action of the fisheries inspectors, been compelled to erect furnaces to burn their sawdust. From a health standpoint this latter procedure gives everything that can be desired, and only requires to be systematically carried out. When the sawdust is removed to the furnace by carriers worked by the machinery of the mills, it may with attention be perfectly performed. But in some instances, as seen by the Secretary of the Board, in an inspection made during the past summer, the carriers are allowed to fall into disrepair and the sawdust allowed to be carried down stream. In other cases, as at Ottawa, for unexplained reasons all the sawdust is allowed to fall directly into the stream, no attempt whatever being made to burn it. This is a matter of most serious import as regards both the fisheries, the public health and navigation of streams. Besides the effects in the immediate vicinity, the deposits accumulate in the bays and mill-dams along the streams below, and it will readily be seen that there will be dangers from the decomposition of the sediment to dwellers at such points along the streams. Plans of the simple furnaces needed, with their cost, are given in the report on Sawdust Deposits in the Appendix; and there can be no valid reason of expense why, in the case of mills creating large amounts of sawdust, such furnaces be not erected to burn it all.

From the character of the nuisances referred to in this chapter, it is apparent that some of them are so connected with the existence of mankind that they must always tend to exist in every community; and it therefore becomes the work of sanitarians to devise, and municipalities and individuals to adopt, measures which will lessen or remove them. The class depending upon industries of various kinds are remediable and will doubtless be mitigated as soon as public opinion is fully alive to the dangers arising from them, and compels manufacturers to accept the decision that the public health must be preserved rather than that (if that be the alternative) individual wealth be increased at its expense.

CHAPTER IV.

INVESTIGATION INTO THE CAUSES OF AND REMEDIES FOR VARIOUS OUTBREAKS OF DISEASE REPORTED TO THE BOARD.

It might perhaps have been better to have divided this chapter into two distinct parts, since the work contained in the first portion is one which partakes of a theoretical character, while that in the latter is one made up largely of routine and executive details. Since, however, it cannot be said that the Board has at its disposal facilities enabling it to take up what may be termed the scientific part of this work of investigating causes of disease, as considered apart from the conditions favouring the development of the cause—it will serve our purpose to discuss under one chapter, what has been done in investigating the methods by which outbreaks of disease have been propagated, and what has been attempted in the way of suppressing them. To know the true cause of disease is certainly more difficult than to limit its spread; but in spite of enormous difficulties, year by year fresh progress is being made in this department of science. As practical sanitarians, we may be permitted to hope that with new light as to the causes of disease, fresh advances will also be made in the measures at present at our command for its control. Though with few exceptions epidemic disease has not been prevalent in Ontario during the past year, yet the operations of the Board in this field have been of unusual interest.

The year opened with telegrams informing the Board that Small-pox had broken out in Simcoe County, and the year ended with cheering telegrams of the favourable results of the Board's operations in Hungerford in suppressing the disease. During the twelve months of the year Small-pox has been present in thirteen counties in Ontario, and from the great number of cases one may conclude that the Province has been menaced during the whole year with the most loathsome of zymotic diseases. The Board has been actively engaged during the past year in limiting these outbreaks, and now looks back on the year's operations with pleasure at the thought of how successful the efforts of Local Boards, supplemented by those of the Provincial Board, have been in keeping the disease from becoming epidemic throughout the Province.

1. *Causes of Outbreaks of Disease.*—Although, as has been said in the introductory remarks of this chapter, the work of the Board during the year in what may be termed the pure science of the cause of disease, in other words its *etiology*, has been almost nothing, nevertheless, several investigations into the methods by which outbreaks have been made possible, have been carefully conducted. As, however, the conclusions regarding the methods by which disease is propagated depend, for their being comprehended, upon the theories held regarding the *materies morbi*, it will be proper, in a report presumably reaching the hands of those not always having professional access to the accounts of the latest advances in biological researches, to give a brief *résumé* of some of those researches carried on by foreign scientists up to date.

The past year's researches have aply illustrated the truth of a remark made in the Second Annual Report of this Board. "In truth, it must on every hand be felt that the evolving of scientific order and precision must for a time, at least, be chaotic. To-day we have an apparently new fact; to-morrow it is modified or rejected, but a residuum of truth remains. The scientific mind of to-day is the crucible in which lies at the bottom the button of refined gold." At the time of writing a year ago, Prof. Koch's *bacillus tuberculosis* had become in the eyes of many an *ignis fatuus*; but to-day its existence may fairly be said to have been placed upon the list of known biological facts, and microscopic specimens have become common objects for sale in the scientific world. Within the year further experiments in France seemed to have placed his discovery of the *Comma bacillus*

of cholera, made in India and Egypt in 1883, similarly in the list of accepted facts, when we find his conclusions rudely questioned, and some would say overthrown, by French *savants*, and by Klein, Cunningham, and other well-known English authorities. It is to be hoped that a correct view of this question will be reached before long.

Klein's now well known researches regarding the *bacilli* of cholera, Pasteur's and Salmon's beautifully clear and conclusive experiments upon the *micrococcus* of chicken cholera, and the experiments of the latter regarding Texas cattle fever, and the researches which are being made by many independent observers on the question of *septic organisms*, especially in their pathological relationships, all indicate that marvellous progress is being made in bacteriology.

Synchronous with these experiments are those upon the substances which act as germicides or disinfectants. The past year has been signalized by the inauguration of a very extensive undertaking with this object in view. We refer to the appointment by the American Public Health Association of a committee to experiment on the action and relative value of various germicides. It is felt that a work of so extensive a character and involving so large an expenditure of time and money could be best conducted by combining the available resources of the many bodies on this continent interested in the subject. The Board has, therefore, had great pleasure in contributing to so praiseworthy an undertaking.

The scientific fact having been established that the destructive *materies morbi* of cholera, of hog cholera, and each of several other diseases, belong to a low class of organisms called microphytes, whose species have seemed infinite in number, the life history of which has, till the last few years, been very imperfectly known, it has been a matter of the deepest interest to determine whether the many varied fevers were modifications of a few species undergoing changes in form, incomplete in their development under ordinary physical conditions, or whether they are really a large family with numerous and distinct species, each with properties and qualities distinct and separate. It was of the first importance, from a sanitary standpoint, to have this point determined, since if it could be proved that saprophytes or that class of microphytes, which feed on dead organic matters, were capable, when being taken into the human system, of developing various types of disease, according to the individual idiosyncrasies or surrounding conditions then, as will readily be understood, most momentous issues would be involved. To determine these points many patient investigators have been labouring, and at the present moment the following may be considered some of the chief conclusions which have been arrived at.

(*a*) That while the numbers of microphytes, which may at different stages of their development, and under varying conditions, appear similar in form, are numerous, yet cultivation and inoculation experiments by Koch, Klein and others have already demonstrated that contrary to Buchner, regarding *bacillus communis*, as opposed to Sattler, in reference to *bacillus subtilis* undergoing changes in infusion of jequirity, and subversive of Chaivitz' theory, by which a common microphyte *aspergillus* may become by cultivation pathogenic, the species of microphytes are definite and unchangeable, always tending to revert to their normal form. Fortunately, all latest experiments have tended to the conclusion, as stated by Dr. Klein, that, "Amongst the region of different species of micrococci and bacilli occurring in putrid substances, the great majority are quite harmless; when introduced into the body of an animal they are unable to grow and multiply, and therefore are unable to produce any disturbance. But some few species there are, which although ordinarily growing and thriving in putrid substances, possess the power, that when introduced into the body of an animal they set up a specified disease. . . . . Those organisms, which are connected with the above morbid processes, possess this pathogenic power *ab initio*, not due to any peculiar condition of growth." Had the opposite conclusion been arrived at, then it is evident that there would be little use in searching into the cause of any zymotic disease, for it would only be necessary to assume certain conditions, in order to have produced small-pox, scarlatina or measles, or any other disease whatever. Remembering, however, that certain specific microbes do flourish in dead organic matter, outside living organisms, *e. g.*, *bacillus anthracis, bacillus septicus*, (microbes of Typhoid and Diphtheria?) the point is given to the sanitary rule for the completest possible

destruction of all dead organic matter, when exposed in such places as might, through the microbes feeding upon it, tend to contaminate air and water.

(*b*) The next point which biologists have been constantly engaged in investigating is, viz: given specific microbes, what are the means, if any, by which they can be either attenuated or destroyed? Following out the theory, which has seen practical results in vaccination for nearly one hundred years, Pasteur and Davaine have initiated and many others have followed up the question of the attenuation of virus. While doubt has been cast, with apparent reason, upon the efficacy of Pasteur's attenuated virus of charbon, sold in tubes known as *vaccin charbonneux*, yet a great advance has been made in exact knowledge of the subject. Professor Salmon lays down definite rules for the use of his vaccine for chicken cholera, and in the extended studies of *charbon symptomatique* by MM. Arloing, Cornevin and others, the following results have been obtained:—

(1) Minute doses of the fresh virus injected into the subcutaneous cellular tissue, confer immunity from subsequent infection.

2. Injected into the veins or respiratory passages, in moderate quantities, a slight disturbance results, and protection is found to be obtained.

3. Numerous experiments with antiseptics have shown that some of them change the virus into a vaccine innoculation, which confers immunity from future infection.

4. Dilutions of virulent fluids in certain cases may confer immunity.

Admitting that all that has been asserted has not been yet verified in practice, it is quite plain that something has been learned, and analogy from vaccination would lead us to infer that ere long definite practical results will have been obtained for us regarding our common zymotics, as scarlatina, measles, etc. The facts asserted by these workers have had other most practical sanitary bearings. Thus, we are informed that minute doses of fresh virus taken into the system confer immunity. In this fact we have a most powerful argument for cleanliness, as regards organic accumulations of whatever kind in sick rooms; since, while nurses, physicians and others, must of necessity inhale morbific germs, yet, if the amount is diluted by ventilation and antiseptics, the probabilities are that they become innoculated insufficiently to give them the disease in its virulent form, and yet sufficiently to make them insusceptible of further infection. In the study of antiseptics, too, great advance has been made. Working as it were backward, from the apparent power which microbes in certain solutions have of limiting their own development, Wernich, and after him many others, have found that the decomposition of *cultures* by microbes results in the formation of certain organic compounds, mostly of the so-called aromatic series, which act at germicides. On analysis of such solutions, they have been found to contain, notably from their decomposition of proteids, *phenylacetic* and *phenyl-propionic* acid compounds. These chemical compounds have been added to cultures containing microbes, when these latter have been rendered *aseptic*. In fact, true germicides have been discovered. For practical ends, however, as has been remarked by Dr. B. Sanderson, for an antidote against infection to be of great value it must be readily procurable, free from poisonous action, and have such physiological relations to the organism (when taken into the system), that it is capable of remaining sufficiently long to exercise its restraining influence on the process it is intended to counteract. Time, it is to be hoped, will give us what we seek in this direction.

2. *How Zymotic Diseases are Disseminated.*—From what has been remarked in the preceding chapter it will be plain that assuming the existence of a specific microbe, as the *materies morbi* of each zymotic disease, the spread of the latter will depend upon various causes, viz., (*a*) the number of the microbes to which people are exposed; (*b*) the frequency of their exposure; (*c*) the virulence of the virus; and (*d*) the susceptibility of those exposed to the disease.

No explanation is necessary to make it apparent that *a* and *b* will almost invariably be co-relatives. In the ordinary zymotics, the culture fluid being the human blood, it will be plain that whatever excretions of the body give them out to the air, will be the mediate cause of their being disseminated. Skin, respiratory organs, intestines and urinary organs are all involved, and give opportunities for contamination from them in various ways according to the absence of attenuating and disinfecting influences. As an

instance of a concentrated virus we may mention a fact which was observed by the Secretary of this Board during the recent outbreak in Hungerford. Eight persons were found lying in one room with no ventilation, each in some stage of the small-pox. No disinfection of the air was attempted, or even possible under the horrible circumstances. Not only were the germs of the disease being constantly given off to the air of the room, but to other organic accumulations there were added the volatile effluvia from lungs and scales from the skin, and secretions from the urinary and intestinal channels. Assuming that those going into the room were protected by vaccination, the volatile effluvia and scales from the skin would cling to clothing, especially of a woollen character, and be disseminated in various directions. Cats or dogs entering such a room would likewise be carriers of the virus. Since the chances of others contracting the disease from such exposed persons, would depend upon the amount carried on clothing, its freshness and the frequency of exposure, it is plain that those susceptible will, under such circumstances, contract the disease. An illustrative case showing how one exposure was sufficient for inoculation was seen in the visit of a reverend father to the Stoco hospital to administer spiritual consolation. Exactly fourteen days after his exposure he showed evidence of having the disease.

A sad case was related some months ago by a correspondent of the Board. A child had been ill with diphtheria and died. The clothing worn by her was given to another little girl. This child who wore the clothing took sick and died, and the two remaining children of the family contracted the disease and also died. Such are amongst the commonest means by which such diseases are disseminated. Other zymotics are conveyed by food and drink. Many examples may be adduced illustrating this fact. Amongst such articles milk, doubtless, is the commonest. In an outbreak of diphtheria at Hendon, January, 1883, when fourteen cases occurred almost simultaneously, all in houses supplied by a particular dairy, the water used in this dairy was taken from a pond, which was found to be fouled to a large extent with sewage. In a wide-spread outbreak at Smith's Falls during the month of December, 1883, and January, February and March, 1884, the purity of the milk was with reason doubted, after the filthy surroundings of the dairy had been examined. In this epidemic, a full report of which will be found elsewhere, the various sources of the disease are clearly shown. In an outbreak of typhoid fever at Almonte, investigated by the Secretary, a public well, some three feet from which ran a house-drain carrying off house-slops, which were allowed to soak into the ground at no great distance, was directly proved to be the cause of typhoid fever in at least six cases, all occurring in houses using water from the well. One or two other families in the vicinity not using water from this well escaped. Other cases, clearly traced to contamination of well-water from the public drain or so-called sewer, which received only accidental flushings, occurred in the same town. These are but typical examples of how disease is disseminated.

3. *Why Allowed to Spread?*—Charity would incline to the conclusion that ignorance of the sources is the chief reason why diseases are allowed to spread; but hard facts often point to quite different conclusions. Doubtless it happens occasionally, as in some cases of typhoid fever, that people are uncertain as to the cause; but in scarlet fever and whooping cough, diseases which even the most unlettered know to be spread by contagion, there is a gross neglect of precautions. There are many reasons: Poverty and the harassing duties of a mother often left to care for a large family of children, blunt her sensibilities through her feeling of helplessness. She is less careful to prevent contact from the conviction that all must have it, and they may as well get over it. Cupidity is another cause, as in the case of the smaller shopkeepers, who, we regret to say it, are at times assisted by the physician, and who endeavour to keep the presence of disease secret for fear of losing customers. An illustrative case of this is given in the details of the Smith's Falls diphtheria outbreak. When typhoid prevails it must be confessed that the municipal authorities, as frequently as private individuals, are culpable. This is notably the case in towns with contaminated sources of water supply, lack of means for disposal of sewage at its outlet, and, further, absence of inspection of drains, plumbing, etc.

4. *Methods adapted for their limitation and extinction.*—In the cases where outbreaks of contagious diseases have been reported the efforts of the Board have been in every case

first exerted in arousing local health authorities, where found apathetic, to a sense of the danger to the public health. This has been largely successful. In most, if not every case, local physicians have been the first, not only to warn the Provincial Board of such existing disease, but have also urged action upon the Local Boards. From the nature of things at present existing, this was to be expected, but remembering that such medical men are occupied in the treatment of disease, it is not to be expected that they can engage largely in its prevention. At this early day in the progress of sanitary knowledge it were perhaps unjust to expect that municipal councils should have as keen an appreciation of the economic benefits to be derived from active organizations for stamping out epidemics present amongst their constituents, as they have of the advantages to be gained from shortening a road to market by the erection of a new bridge: but it is quite apparent that if they continue to delegate public health work to local physicians who are expected to labour without pay as medical health officers for the good of the public, they need not expect local sanitary conditions to improve at all proportionately with the public needs. Not unnaturally, Local Boards endeavour to stamp out disease after the disease has made so much headway that its presence seems to threaten the immediate safety of the whole community. Such has been the case, noticeably in several local epidemics during the past year. It must not be forgotten, however, that the best work has probably in many instances been done in those municipalities of which but little has been heard, since the outbreaks of contagious diseases occasionally take place in every municipality, and the very nature of good sanitary work requires that first cases be so promptly dealt with that no second ones occur. In most cases, doubtless, this has been due to the skill of the physicians in charge, and it augurs well for the status of the profession in Ontario that, apart from Local Boards, so much has been done during the past year to prevent epidemics from obtaining, except in a few cases, much foothold in the Province.

It will be of interest, however, to refer to several local outbreaks as illustrating how the progress of organized sanitary effort is making itself felt for good in Ontario. One of the most extensive outbreaks of diphtheria during the year occurred in Smith's Falls, breaking out early in December, 1883, and lasting for several months. The full particulars of this outbreak, which extended to 36 families, have been received, and from them it appears there were in all 91 cases and 24 deaths. No Board of Health being in existence at the beginning of the outbreak, it attained such dimensions in a short time that public alarm caused a Board of Health to be formed. Seconded by several medical men of the district, the Board succeeded in isolating many cases and placarding the houses where cases of the disease were known to be. They then called upon the Provincial Board to aid them. The secretary of this Board visited Smith's Falls and made an investigation, a report of which is published in the Appendices. He also directed the Local Board as to methods of procedure in various emergencies, and delivered a public lecture on the sources of zymotic diseases and the best methods for combating them. The Local Board further distributed a large number of the pamphlets issued by the Provincial Board on "How to Check the Spread of Contagious Diseases." When the Health Act of 1884 went into force, the Local Board was organized on a new basis, and a Medical Health officer appointed. The disease, from the time that the Local Board of Health instituted and prosecuted active measures for its limitation, was practically under control, and the deaths which have since resulted from the disease have been very few.

Typhoid fever has not been present in many places during the past year as an epidemic, and the Provincial Board have not been called upon to investigate in many instances.

The reports of the investigations of the sanitary condition of the Penetanguishene Reformatory and of the Asylum for the Insane at Kingston indicate the great danger to which large numbers of people collected in public buildings are exposed when defects occur in the sewerage of these buildings, or when a contamination of the water supply takes place. Full reports of those investigations will be found in the Appendices. In an outbreak in the town of Almonte, to which reference has already been made, the Local Board of Health was rendered helpless in its efforts of reform from the absence of that financial aid which was necessary to carry out its proposed operations. The Secretary of the Provincial Board, after correspondence had failed in obtaining action on the

part of the Council, made a visit of investigation to the town, and reported thereon to the Provincial Board. A copy of the recommendations made after the investigation was sent to the Local Board. They were confirmed by the Provincial Board. A copy of them will be found in the Appendices. It is to be hoped, that with typhoid fever endemic in the town, its Council will more thoroughly appreciate, during the coming year than it has in the past, the necessity for undertaking comprehensive improvements, such as are indicated in the report of the Secretary. After years of a *laissez faire* policy in health matters, the town has much to do; and it is high time that a beginning was made by those who are conservators of its interests from both a commercial and a health standpoint.

In the Town of London East a severe outbreak of fever occurred along Carling's Creek during the early autumn months. This municipality, along with the municipalities of London City and London Township, petitioned the Provincial Board for an expression of opinion as to the most advisable way of disposing of the sewage of all these municipalities, which becomes yearly a greater nuisance to the public health. The question has been referred to the consideration of the Committee on Sewage of the Provincial Board to report so soon as the weather will permit of such an examination as must necessarily be made. Of all the outbreaks of epidemic disease which have created public alarm, and which have called for the promptest measures on the part of the Provincial Board, those of small-pox have been by far the most important. The excessive contagiousness of this disease, its fatal nature and the fear caused by its loathsome character, make it one which brooks of no delay, although too often it happens that the question of "who is to grapple with it?" becomes a very difficult one to answer.

It speaks volumes for some of the medical men who, as far as concerned them personally, were unfortunate enough to have these cases fall into their hands, that they should have aided so energetically in taking such means as limited the outbreak to the first case or cases; while in the public interest it is necessary to denounce in the strongest terms the action of others, who, for fear of injury to individual interests, have exhibited culpable carelessness in their action towards such cases.

Detailed reports concerning each of the outbreaks which have occurred during the year will be found in the Appendices. These reports will clearly show how want of proper methods in sanitary matters leads to serious illness, often loss of life, and unnecessary expense, while on the contrary prompt attention to the requisite preventive measures is followed by the very best results.

CHAPTER V.

STATISTICS OF DISEASE IN ONTARIO.

We feel great pleasure in again being able to report the continued progress of the work of collecting disease statistics in Ontario. The *Health Bulletins*, which at first, were published every week, are now issued monthly, and continue, as in the past, to furnish as fully as the circumstances of their collection will permit, a summary of the health conditions of the Province.

The *Bulletin* has been utilized by the Secretary as a convenient means of not only announcing the existence of special or unusual conditions of the public health, but also of stating in a brief and pointed manner inferences which may be drawn regarding the sanitary questions which these health conditions involve. It is pleasing to be able to report that these *Bulletins* are received with so much favour by the public that the leading daily journals publish very full summaries of their contents. The extensive circulation which is thus accorded by the press to matters which must be interesting to every reflecting mind will, no doubt, contribute materially to the education of the public in sanitary matters.

At the present day, when the study of natural science is being prosecuted with such assiduity that discoveries of new facts are of daily occurrence, and when in addition the immense number of subjects of study is considered, it is hardly to be wondered at that many feel themselves unequal to the effort of keeping pace with scientific progress. In order to make a general knowledge of these numerous discoveries at all possible, it is absolutely necessary that the basis principles underlying them be grasped, when the details of otherwise disjointed facts will take on form and order. Especially is this remark true in the field of disease. An enormous number of facts must be noted annually by the 2,000 medical practitioners in attendance on the 40,000 persons who, according to a calculation made last year, are ill at any one time during the whole year in Ontario. Could these facts be all collected, classified, studied and annotated, valuable contributions to science would be made. But if the comparatively few underlying principles, common to them all, could become generally known, what an enormous addition would be made to popular knowledge. It is, therefore, of the utmost importance in the study of disease that the largest possible collection of statistical facts be made, in order that the principles deduced from them may become known. When it shall become a perfectly well understood thing amongst the public at large, that most of our zymotics are examples of septicæmia, and that the microphytes of septicæmia are in a large measure dependent upon organic filth, as is becoming day by day more evident, it may be confidently predicted that such an epoch of cleanliness will be ushered in as has never been known since the days of the Israelites and their daily purifications.

From these statistics, and likewise from mortality statistics, we gain a knowledge of the special diseases incident to different occupations, seasons, sanitary surroundings, ages, localities and climates. To such statistics we look for our arguments to show the necessity for adopting municipal sanitary legislation, or governmental statutory enactments for enforcing general sanitary provisions, or for making vaccination compulsory. As was seen in the report of a single year's statistics—in last years' report—a number of important facts regarding prevailing diseases in Ontario have been pointed out, and the same may be said of this year's report. To illustrate this by a single fact, we have been able to ascertain from the exact statistics of the Hungerford outbreak, that the mortality from small-pox in that township presents among the vaccinated and the unvaccinated nearly the same proportion as has been found to be the case in other countries, viz:—6 per cent. of deaths in those previously vaccinated, and 33 per cent. in those never vaccinated. Similar satisfactory results will obtain in other districts, when we are able to obtain as thoroughly reliable data from which to make deductions.

2. *Their Sanitary Use, as Experienced by the Board.*—The issue of the *Bulletin* as a weekly, almost from the organization of the Board, has been one of the most valuable agencies by which we have been enabled to initiate and develop municipal health work throughout the Province. At no little inconvenience to themselves, medical men in all parts of the Province responded to the request of the Board to become its correspondents, and from them the Board has received many valuable suggestions, made with the view of increasing the usefulness and efficiency of the disease reports. But this is but a very small amount indeed of the public health work which these gentlemen have voluntarily performed. By their reports the secretary has been time and again informed of the epidemic prevalence of some virulent zymotic, a knowledge of which he would otherwise have never obtained, and the Board has thus been enabled to take effective action toward the end of restricting it. In fact, it may fairly be said that up to the time when the Health Act of 1884 came into force, containing a compulsory clause requiring a Local Board of Health to be formed in every municipality, no other machinery existed by which the Board could keep itself informed of the state of the public health throughout the Province. Dangers to the public health of various kinds have been reported again and again; and correspondents of the Board have been as courteous in assisting in their suppression as they have been in reporting them. The Board has further succeeded in adding to its list of correspondents the medical health officers who have recently been appointed, and who form a percentage of nearly one-tenth of all the practitioners of the Province. Judging from the willingness of those last mentioned gentlemen, the Board feels assured that there are very many more members of the medical profession in Ontario who will aid in what the Board feels no hesitation in characterizing as one of the most successful attempts ever made to obtain statistics of diseases. But in making this assertion we do not wish to be understood as asserting that our disease statistics have the soundness and completeness of statistics taken in the army, navy, or hospital services under circumstances more or less special; but we think their value consists principally in the fact that they are a faithful reflex of most of the disease conditions prevalent among the 2,000,000 who form the population of Ontario.

Their Statistical Value.—As we remarked in the Second Annual Report, "The Board does not assume to dogmatize concerning any deductions drawn from a study of these statistics." This is due to the fact that from the limited number of reports, generalizations can only be made with extreme care, yet, should year after year see the same facts repeated, it may fairly be concluded that any inferences drawn from them will be in a large measure correct. Remembering the very many elements which enter into any pathological fact, as those of age, surrounding conditions, climate, etc., it makes it a matter in some cases of extreme difficulty to determine how much influence must be assigned to any given condition. But, while this is true, there are, nevertheless, certain well-grounded conclusions slowly growing up regarding the causes of the prevalence of certain diseases, under certain conditions, and of no class can this be more truly said than of Zymotic diseases, or those which it especially becomes the sanitarian to study. We trust that the statistics of disease in Ontario may continue to be interesting to many members of the medical profession in this Province, and that they will continue in increasing numbers to aid us in extending a work which promises to be of real benefit to medical science.

How Obtained and how Utilized.—On this subject almost nothing new can be said in addition to what has been written in the two past reports of the Board. The public have become so familiar with these reports as they appear in the newspapers, that they already partly understand how the statistics are utilized. Another method, however, in which they have been used is that seen in the extended study made of them in the Second Annual Report of the Board. It is to be hoped that a shorter study based upon similar data, to be found in an appendix of this report, will be found as interesting as we believe the last has proved to those who were willing to patiently study the mass of details presented in it. The utilization of these data for sanitary purposes, by obtaining from them knowledge regarding local outbreaks of disease, thus enabling the Board to urge or cause to be taken by local health authorities, active measures for the suppression

of these outbreaks has been already mentioned. What these statistics have done in the past they will continue to do in the future, while, as Local Boards of Health become more efficient, we may fairly hope to see them adopting similar schemes for obtaining in their respective municipalities such complete reports as will enable them to be thoroughly acquainted with the type of disease which may be prevalent in their midst and be thus in a position to effectually combat it.

In concluding this report, which briefly sets forth the work done during the year, it gives the Provincial Board much pleasure to note the rapidly spreading knowledge concerning many of the sanitary matters with which the Board is called upon to deal, and that as a consequence of this, the necessity is deemed for extending the details of this report to the extent which last year it was deemed advisable. It suffices to say that the Board trusts that the report will be found to contain a complete summary of the work done, and of the methods which have been adopted in performing it. What was remarked in the conclusion of the Second Annual Report may be repeated here: "That if Ontario has but little room for self-laudation, she has in a relative sense no cause for self-condemnation" in regard to the action taken in matters pertaining to the public health: and the Board would hope that its persistent efforts for obtaining more extended action in Canada in regard to public health matters by drawing the attention of the Federal Government and those of the other Provinces to them may result in the establishment of a national system for the promotion of the public health, the far-reaching benefits of which it is impossible to estimate. We welcome the prospect that during the coming year the sister Province of Manitoba will establish an organization on a basis similar to our own: and the Board will not cease to entertain the hope that to the eastward we shall soon have raised up Dominion and Provincial barriers to the fatal progress toward us of those epidemic diseases which, through our relations with the motherland, are ever likely to be introduced.

All which the Board respectfully submits to your Honour.

C. W. COVERTON, Chairman.
P. H. BRYCE, Secretary.

PART II.

APPENDICES.

APPENDIX A.

Article I.

AN ACT TO MAKE FURTHER PROVISIONS RESPECTING THE PUBLIC HEALTH.

Chapter 38, R. S. O.

HER MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows :—

Part I.—Preliminary.

Short title.

1. This Act may be cited as "*The Public Health Act, 1884.*"

Interpretation.

2. In this Act the following words and expressions shall have the meaning hereinafter assigned to them respectively, unless such meaning is inconsistent with the context, that is to say :

"Owner."

(1) "Owner" means the person for the time being receiving the rent of the lands or premises in connection with which the word is used, whether on his own account or as agent or trustee of any other person, or who would so receive the same if such lands and premises were let.

"Health District," "District," "Local Board," and "Board."

(2) "Health District" or "district" means any local municipality, or union of local municipalities, under the jurisdiction of a Local or District Board of Health, and "Local Board" or "Board" shall include a District Board.

"House."

(3) "House" includes schools, factories and other buildings, huts and tents used for human habitation or work, whether such use is permanent or temporary, and whether the same are stationary or movable.

"Street."

(4) "Street" shall include every highway, road, square, row, lane, mews, court, alley and passage, whether a thoroughfare or not.

Powers of Provincial Board to make regulations for prevention or mitigation of disease.

3. Whenever this Province, or any part thereof or place therein appears to be threatened with any formidable epidemic, endemic, or contagious disease, the Provincial Board of Health may, subject to the approval of the Lieutenant-Governor in Council, issue such regulations as the Board deems necessary, for the prevention, as far as possible, or the mitigation, of disease, and may make, renew or alter any such regulations, or substitute new regulations : and the said Board may, by such regulations, provide :

(1) For the frequent and effectual cleansing of the streets, yards, and out-houses, by the local health authorities, or by the owners or occupiers of houses and tenements adjoining thereto.

(2) For the removal of nuisances.

(3) For the cleansing, purifying, ventilating and disinfecting of houses, churches, buildings, and places of assembly, railway stations, steamboats, railway carriages and cars, as well as other public conveyances by the owners and occupiers, and persons having the care and ordering thereof.

(4) For regulating, so far as this Legislature has jurisdiction in this behalf, with a view of preventing the spread of infectious disease, the entry or departure of boats or vessels at the different ports or places in Ontario, and the landing of passengers or cargoes from such boats or vessels, or from railroad carriages or cars, and the receiving passengers or cargoes on board the same.

(5) For the safe and speedy interment of the dead, and the conduct of funerals, with a view of preventing the spread of infectious diseases as aforesaid.

(6) For supplying medical aid, and accommodation, and medicine, and such other articles as may be deemed necessary for mitigating such epidemic, endemic, or contagious disease.

(7) For house to house visitation.

(8) For preventing or mitigating such epidemic, endemic or contagious disease in such other manner as to the said Provincial Board seems expedient.

Local Boards to see to execution of regulations.

4. It shall be the duty of the Local Boards of Health to superintend and see to the execution of any such regulations; or to execute, or aid in executing the same within their respective districts; and to do and provide all such acts, matters and things as are necessary for superintending or aiding in the execution of such regulations, or for executing the same as the case may require.

Provincial Board may determine extent of liability to which regulations are to apply.

5. The Provincial Board of Health may, by order, declare all or any of the regulations so made to be in force within the whole or any part or parts of the district of any Local Board of Health or any municipality, and, so far as this Legislature has jurisdiction, to apply to boats, vessels, railway carriages and cars, or other conveyances in any portion or portions of the Province.

Publication of orders and regulations.

6. All orders and regulations so made shall take effect from the approval thereof and shall be forthwith published in the *Ontario Gazette* and at least one newspaper within the district, or portion or portions of the Province, in which they shall be declared in force.

Conflicting by-laws of Local Board suspended.

7. During the time that any such orders or regulations are in force in any Health District as provided by the four next preceding sections of this Act, all by-laws of the Local Board of such district which, in any manner, conflict with any such order or regulations, shall be suspended.

Expenses of Provincial and Local Boards, how defrayed.

8. The expenses incurred by the said Provincial Board of Health in connection with such epidemic, shall be defrayed out of any moneys appropriated by the Legislature specially for that purpose, and the expenses incurred by the said Local Boards of Health in the execution or in superintending the execution of the regulations of the Provincial Board, shall be defrayed and provided for by the Municipal Corporations having jurisdiction over the respective places affected.

Prosecution for neglect of regulation.

9. The Local Board of Health may also, from time to time, direct any prosecution or legal proceedings for, or in respect of, the wilful violation or neglect of any such regulation.

Meetings of Board.

10. The Provincial Board of Health shall meet quarterly at Toronto, and at such other places and times as may be fixed under a resolution of the Board. Three members shall be a quorum for the transaction of business.

Investigations as to causes of contagious or other diseases.

11. With the concurrence of that member of the Executive Council to whose department the Provincial Board of Health is for the time being assigned by the Lieutenant-Governor in Council, the Board may send its secretary, or any member or members of the Board, to any part of the Province when deemed necessary, to investigate the cause or causes of any contagious or other disease or mortality: and at such investigation evidence may be taken on oath or otherwise as the said secretary, member or members may deem expedient; and in such case the secretary, or any member of the Board present at the investigation, may administer the oath; and the said investigating committee shall have power by warrant, under the hand and seal of any one of its members, to call upon any person to give evidence regarding any matter in question in the said investigation: and the said investigating committee shall have all the powers which may be conferred upon Commissioners under *The Act respecting Inquiries concerning Public Matters.*

Part II.—Local Boards of Health: Their Organization.

Local Boards of Health, their constitution and powers.

12. (1) All the powers and authorities conferred upon or vested in the members of any municipal council or councils by any statute of the Legislature of this Province, as health officers of the said municipality or municipalities, shall hereafter be vested in the Local or District Board of Health which shall be formed in such municipality or municipalities as hereinafter provided.

(2) There shall be a Local Board of Health in each township and incorporated village, to be composed of the reeve, clerk and three ratepayers, to be appointed annually by the municipal council.

(3) There shall be a Local Board of Health in each town containing less than four thousand inhabitants according to the municipal enumeration of the previous year, to consist of the mayor, clerk and three ratepayers, to be appointed annually by the municipal council.

(4) There shall be a Local Board of Health for each city and for each town containing more than four thousand inhabitants, according to the municipal enumeration of the previous year, to consist of the mayor and eight ratepayers, to be appointed annually by the municipal council.

Appointment of members of Board.

13. (1) The first appointment of members of the said Board shall be made at the first meeting of the municipal council after the first day of May next.

(2) The annual appointments thereafter shall be made at the first meeting of the municipal council after being duly organized, and any vacancy arising from any cause shall be filled at the first meeting thereafter of the municipal council: but, if for any reason appointments are not made at the said dates, the same shall be made as soon as may be thereafter.

Union of municipalities in one Health District.

14. Two or more councils may, by concurrent by-laws, unite their respective municipalities into a Health District; and any of such councils may withdraw its municipality from the District by a by-law passed prior to the first day of December of any year, and to take effect on the third Monday of January following.

Constitution of District Boards of Health.

15. The members of the District Boards of Health shall consist of three members from each municipality included in the District, namely: the head of the council, the municipal clerk, and one other ratepayer not a member of the council, to be appointed by the council.

Powers of District Boards.

16. Every District Board thus constituted and its members shall, in respect of the Health District for which it acts, possess the same powers, be subject to the same regulations, and perform like duties as a Local Board of Health of a municipality and its members.

Officers of Local or District Boards.

17. Every Local or District Board shall elect a chairman, and the Clerk of the Municipal Council shall be the secretary of the Local Board, and the District Board may elect one of its members, or appoint some other person, as its secretary.

Secretary to report to secretary of Provincial Board the names of members.

18. It shall be the duty of the secretary to report to the secretary of the Provincial Board of Health the names of the members of the Local Board within one month after its first regular meeting, which shall be held on the second Monday after the members, who are not members *ex officio*, have been appointed.

Provincial Board may appoint to Local Board in case Council neglects to do so.

19. When any municipal council neglects or refuses to elect members or a member of the Local or District Board of Health as required by this Act, the Provincial Board of Health may appoint a duly qualified ratepayer or ratepayers to be a member or members of such Local or District Board of Health to act with the *ex-officio* or other members.

Appintment of Medical Health Officer and Sanitary Inspector.

20. Every Municipal Council may appoint a Medical Health Officer and a Sanitary Inspector or Inspectors for the municipality, and may fix the salaries to be paid them, or two or more councils may unite in the appointment of any of these officers.

Part III.—Powers and Duties of Local Boards.

Appropriation for work.

21. The Municipal Council or Councils may vote such sums as are deemed necessary by the Local or District Board for the carrying on of its work.

Health Officers.

22. The members of the Local and District Boards shall be Health Officers within the meaning of *The Revised Statute respecting the Public Health*, and shall have the powers and duties assigned to Health Officers by the said Act, and the other powers and duties assigned by this Act.

Quorum.

23. A majority of the number of any regularly constituted Board shall be a quorum for the transaction of business.

Duties of Secretary.

24. A minute book shall be provided in which the Secretary shall record the proceedings of the Local Board of Health. The Secretary shall draft an annual report of the sanitary work done during the year, and of the sanitary condition of the municipality, for the consideration of the Board; which report, when adopted, shall be transmitted to the Secretary of the Provincial Board of Health. The said report shall include the annual report of the Medical Health Officer.

25. Whenever any Local Board of Health has any authority to direct that any matter or thing should be done by any person or corporation, such Local Board of Health may also, in default of its being done by the person, direct that such matter or thing shall be done at the expense of the person in default, and may recover the expense thereof with costs by action or distress; and, in case of non-payment thereof, the same shall be recovered in like manner as municipal taxes. Mode in which Local Board may enforce its authority.

26. Wherever the order of any Local Board of Health or Health Officer involves an expenditure of more than $100, the party against whom the order is made, or anyone chargeable with such expenditure, or any part thereof, may within four days from his being served with a copy of such order in writing, appeal therefrom to the County Judge, who shall have full authority to vary or rescind the order made, and any order so varied may be enforced by the board or officer in the same manner as an order originally made by the board or officer. Appeal to County Judge in certain cases.

27. Any costs or expenses recoverable from an owner of premises under this Act, or under any provision of law in respect of the abatement of nuisances, may be recovered from the occupier for the time being of such premises; and the owner shall allow such occupier to deduct any moneys which he pays under this enactment out of the rent from time to time becoming due in respect of said premises, as if the same had actually been paid to such owner as part of said rent: Provided, that no such occupier shall be required to pay any further sum than the amount of rent for the time being due from him, or which after demand of such costs or expenses from such occupier, and after notice not to pay his landlord any rent without first deducting the amount of such costs or expenses, becomes payable by such occupier, unless he refuses truly to disclose the amount of his rent and the name and address of the person to whom rent is payable; but the burden of proof that the sum demanded from any such occupier is greater than the rent due by him at the time of such notice, or which has since accrued, shall be on such occupier: Provided, also, that nothing herein contained shall affect any contract between any owner or occupier of any house, building or other property whereby it is, or may be, agreed that the occupier shall pay or discharge all rates and dues and sums of money payable in respect of such house, building or other property, or affect any contract whatever, between landlord and tenant. Recovery of costs and expenses of execution of provisions relating to nuisances. Proviso. Proviso.

Nuisances, etc.

28. It shall be the duty of every Local Board of Health to cause to be made, from time to time, inspection of its district, in order to prevent the accumulation within the district of any dirt, filth or other thing which may endanger the public health, and with a view to ascertain what nuisances exist calling for abatement under the powers of this Act, or of *The Revised Statute respecting the Public Health*, and to enforce the provisions of this Act and the said Revised Statute in order to abate every such nuisance. Duty of Local Board to inspect districts for detection of nuisances.

29. A medical health officer of a municipality may exercise any of the powers conferred upon health officers by sections 3, 4 and 5 of *The Revised Statute respecting the Public Health*, and may, without being specially authorized by the Board, exercise any powers which under section 6 can be conferred upon two medical practitioners, and the Board may act on his report. Powers of Medical HealthOfficer.

30. Information of any nuisance or unsanitary condition under this Act within the jurisdiction of any Local Board may be given to such Local Board by any person aggrieved thereby, or by any two inhabitant householders, or Information of nuisances to Local Board.

by any officer of such Local Board, or by any constable or officer of the police force within the jurisdiction of the Board.

Investigation to be made by Local Board.

31. Whenever such information has been so given, it shall be the duty of the Local Board of Health to investigate the cause of the said complaint; and to hear the testimony of all persons who may be produced before it to testify in respect of any such matter; and every Local Board or any two of its members shall have the same authority as a Justice of the Peace to require and compel the attendance of witnesses and the giving of evidence.

Local Board to serve notice requiring abatement of nuisance.

32. Whenever the Local Board of Health is satisfied of the existence of the nuisance, it shall serve a notice on the person by whose act, default or sufferance the nuisance arises or continues, or, if such person cannot be found, on the owner or occupier of the premises on which the nuisance exists or from which the same arises, requiring him to abate the same within a time to be specified in the notice, and to execute such works, and do such things, as may be necessary for that purpose, provided:

First,—That when the nuisance arises from the want or defective construction of any structural convenience, or where there is no occupier of the premises, notice under this section shall be served on the owner;

Second,—That where the person causing the nuisance cannot be found, and it is clear that the nuisance does not arise or continue by the act or default of the owner or occupier of the premises, and it is therefore improper that such owner or occupier should be required to abate the said nuisance, the Local Board of Health may report the facts to the municipal council or councils, and such council or councils may abate the nuisance at the expense of the municipality or district.

Power to proceed where cause of nuisance arises without district.

33. Where a nuisance in any municipality or district appears to be wholly or partially caused by some act or default committed or taking place outside of the said municipality or district, the Board of Health of such municipality or district may take or cause to be taken against the person by whose act or default the nuisance is caused in whole or in part, any proceedings in relation to nuisances by this Act authorized, with the same incidents and consequences, as if such act or default were committed or took place wholly within its jurisdiction, so, however, that summary proceedings shall in no case be taken otherwise than before a court having jurisdiction in the municipality or district where the act or default is alleged to be committed or take place.

Recovery of costs and expenses incurred in abating nuisances.

34. All reasonable costs and expenses incurred in abating a nuisance shall be deemed to be money paid for the use and at the request of the person by whose act, default or sufferance the nuisance was caused, and such costs and expenses shall be recovered by the municipal council or Local Board of Health or person incurring the same, under ordinary process of law; and the court shall have power to divide costs, expenses and penalties between persons by whose acts or defaults a nuisance is caused as to it may seem just.

Restriction or establishment of offensive trades.

35. In case any person after the passing of this Act, establishes, without the consent of the municipal council of the locality, any offensive trade; that is to say, the trade of:—

Blood boiling, or
Bone boiling, or
Refining of coal oil, or
Extracting oil from fish, or

Storing of hides, or
Soap boiling, or
Tallow melting, or
Tripe boiling, or
Slaughtering of animals, or
The manufacturing of gas, or

any other noxious or offensive trade, business or manufacture, or such as may become offensive, he shall be liable to a penalty not exceeding $250 in respect of the establishment thereof; and any person carrying on a business so established shall be liable to a penalty not exceeding $10 for every day on which, after notice in writing by the Local Board, or an officer thereof, to desist, the offence is continued, whether there has or has not been any conviction in respect of the establishment thereof.

Provision where abatement of nuisance involves considerations of difficulty.

36. (1) If on an investigation by any Local Board of Health any nuisance or thing prejudicial to health is found to exist in a municipality in which it has jurisdiction; and if, after the Board has required the removal or abatement of the same within a specified time, the Board finds that default in such removal or abatement has been made, and the case seems to the Board one involving considerations of difficulty owing to the fact that such removal or abatement involves the expenditure or loss of a considerable sum of money, or that any trade or industry is seriously interfered with, or owing to other circumstances, the Local Board of Health may apply to the Provincial Board of Health to investigate and report upon the same, and it shall be the duty of the said Provincial Board, with the approval of the Minister of the Department, to make a full investigation and report.

(2) If the said report recommends the removal or abatement of such nuisance or thing, the Local Board or any ratepayer of the municipality, or within a mile thereof, may apply to the High Court of Justice, for an order for the removal, or abatement of the nuisance or unsanitary condition, and to restrain the proprietors of any such industry from carrying on the same, until the said nuisance shall have been abated to the satisfaction of the Provincial Board of Health; and the said judge may, if he thinks proper, issue such order upon the report of the Provincial Board of Health.

Proceedings on complaint to Provincial Board of default of local authority.

37. (1) Whenever information is obtained by the Provincial Board that any remediable unsanitary condition or nuisance exists in any municipality, and that the local health authorities have, after proper representation of the facts, neglected or refused to take such efficient measures as might remove such condition or abate such nuisance, it shall be competent for the Provincial Board of Health to institute an investigation, and, if necessary, take sworn evidence concerning the condition or nuisance complained of.

(2) If, upon such investigation it is proved that such remediable unsanitary condition or nuisance exists, it shall be within the province of the Provincial Board to direct its immediate removal or abatement by the individual or person responsible therefor, and to report the same to the Minister for the time in charge of the Department; and if such individual or person neglects or refuses to remove or abate the same, the Provincial Board of Health may cause such removal or abatement to be made, and collect the expenses therefor from such individual or person by ordinary process of law.

Contemplated Systems of Public Water Supply, Sewerage, Drainage, etc.

Plans relating to proposed public water

38. (1) Whenever the establishment of a public water supply or system of sewerage shall be contemplated by the council of any city, town or village,

Supply or system of sewerage to be submitted to Provincial Board.

it shall be the duty of the said council to place itself in communication with the Provincial Board of Health, and to submit to the said Board, before their adoption, all plans in connection with said system.

(2) It shall be the duty of the Provincial Board of Health to report whether, in its opinion, the said system is calculated to meet the sanitary requirements of the inhabitants of the said municipality; whether any of its provisions are likely to prove prejudicial to the health of any of the said inhabitants, together with any suggestions which it may deem advisable; and to cause copies of said report to be transmitted to the Minister of the Department to which the said Provincial Board of Health is attached, and to the Clerk of the Municipal Council, and the Secretary of the Local Board of Health of the District interested.

(3) No sewer, or appliance for the ventilation of the same, shall be constructed in violation of any of the principles laid down by the Provincial Board of Health, subject to appeal to the Lieutenant-Governor in Council.

Unsound Meat, etc.

Power of Medical Health Officer or Sanitary Inspector to inspect meat, etc.

39. (1) Any Medical Health Officer or Sanitary Inspector may, at all reasonable times, inspect or examine any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, grain, bread, flour, or milk exposed for sale, or deposited in any place for the purpose of sale, or for preparation for sale, and intended for the food of man: the proof that the same was not exposed or deposited for any such purpose, or was not intended for the food of man, resting with the party charged; and if any such animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, grain, bread, flour or milk appears to such Medical Officer or Inspector to be diseased, or unsound, or unwholesome, or unfit for the food of man, he may seize and carry away the same, or cause it to be seized and carried away, in order that he may cause it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man.

(2) The person to whom the same belongs, or did belong at the time of exposure for sale, or in whose possession or on whose premises the same was found, shall be liable to a penalty not exceeding $100 for every animal, carcase, or fish, or piece of meat, flesh or fish, or any poultry or game, or for the parcel of fruit, vegetables, grain, bread or flour, or for the milk so condemned; or, at the discretion of the convicting justices or magistrate without the infliction of a fine, to imprisonment for a term of not more than three months.

Penalty for hindering officer from inspecting meat, etc.

40. Any person who in any manner prevents any Health Officer or Sanitary Inspector from entering any premises and inspecting any animal, carcase, meat, poultry, game, flesh, fish, fruit, vegetables, grain, bread, flour or milk exposed or deposited for the purpose of sale and intended for the food of man; or who obstructs or impedes any such Medical Officer, or Inspector, or his assistant when carrying into execution the provisions of this Act, shall be liable to a penalty not exceeding $25.

Infectious Diseases and Hospitals.—Provisions against infection.

Local Board to notify owner of premises requiring to be cleansed and disinfected.

41. Where any Local Board of Health is of opinion, on the certificate of its Medical Health Officer or of any other legally qualified medical practitioner, that the cleansing and disinfecting of any house, or part thereof, and of any articles therein likely to contain infection, would tend to prevent or check infectious disease it shall be the duty of such Local Board of Health to give notice in writing to the owner or occupier of such house or part thereof,

requiring him to cleanse and disinfect, to the satisfaction of the Medical Health Officer, such house or part thereof and articles, within a time specified in such notice.

Penalty, if notice not complied with.

42. If the person to whom notice is given fails to comply therewith, he shall be liable to a penalty of not less than twenty-five cents and not exceeding $2 for every day during which he continues to make default; and the Local Board of Health shall cause such house, or part thereof, and articles to be cleansed and disinfected, and may recover the expenses incurred from the owner or occupier in default in a summary manner.

Special provision in case of poverty of owner.

43. Where the owner or occupier of any house or part thereof is, from poverty or otherwise, unable, in the opinion of the Local Board of Health, efficiently to carry out the requirements of the two preceding sections, such Local Board of Health may, without enforcing such requirements on the owner or occupier, cleanse or disinfect such house, or part thereof, and articles, and defray the expense thereof.

Power of Local Board to provide hospitals.

44. In case the small-pox, or any other disease dangerous to the public health, breaks out in any municipality, the health officers or Local Board of Health, in case the municipality shall not have already provided the same, shall immediately provide such a temporary hospital, hospital-tent, or other place or places of reception for the sick and infected, as they shall judge best for their accommodation and the safety of the inhabitants, at the cost of the municipality, and for that purpose may

(1) Themselves erect such hospital-tents, hospitals, or places of reception; or

(2) Contract for the use of any such hospital or part of a hospital or place of reception; or

(3) Enter into any agreement with any person having the management of any hospital, for the reception of the sick inhabitants of their district, on payment of such annual or other sum as may be agreed on; or

(4) Two or more Local Boards of Health may combine in providing a common hospital.

Provision of conveyance for persons suffering from disease or accident.

45. Any Local Board of Health may provide, maintain, or hire a carriage or carriages, suitable for the conveyance of persons suffering from disease or accident, and may pay the expense of conveying therein any person so suffering to a hospital or other place of destination.

Notice to be given by householder in case of small-pox, etc.

46. Whenever any householder knows that any person within his family or household has the small-pox, diphtheria, scarlet fever, cholera, or typhoid fever, he shall within twenty-four hours give notice thereof to the Local Board of Health, or to the Medical Health Officer of the district in which he resides, and such notice shall be given either at the office of the Medical Health Officer, or by a communication addressed to him and duly mailed within the time above specified, and in case there is no Medical Health Officer, then to the Secretary of the Local Board of Health either at his office or by communication as aforesaid.

Householder not to permit removal of person or of clothing.

47. No householder in whose dwelling there occurs any of the above mentioned diseases, shall permit any person suffering from any such disease, or any clothing or other property to be removed from his house, without the consent of the Board or of the Medical Health Officer or attending physician,

and the said Board, or Medical Health Officer, or attending physician, shall prescribe the conditions of such removal.

Removal of sick persons and others in same household.

48. No person sick with any of the diseases above specified shall be removed at any time except by permission and under direction of the Board of Health, or Medical Health Officer, or attending physician, nor shall any occupant of any house in which there exists any of the above diseases, except typhoid fever, change his or her residence to any other place without the consent of the Board, or of the Medical Health Officer, or attending physician who shall in either case prescribe conditions as aforesaid.

Report to be made by Physician.

49. Whenever any physician knows that any person whom he is called upon to visit is infected with small-pox, scarlet fever, diphtheria, typhoid fever, or cholera, such physician shall within twenty-four hours give notice thereof to the Local Board of Health, or Medical Health Officer of the municipality in which such diseased person is, and in such manner as is directed by rules 2 and 3 of section 17 of Schedule A.

Precautions to be taken against spread of infection.

50. When the small-pox, scarlet fever, diphtheria, cholera, or any other contagious disease, dangerous to the public health, is found to exist in any municipality, the health officers or Local Board of Health shall use all possible care to prevent the spreading of the infection or contagion, and shall give notice of infected places by such means as, in their judgment, is most effective for the common safety.

Sick person or persons having access to sick not to mingle with general public.

51. Except the attending physician or clergyman, no person affected with small-pox, scarlet fever, diphtheria or cholera, and no person having access to any person affected with any of the said diseases shall mingle with the general public until such sanitary precautions as may be prescribed by the Local Board or attending physician shall have been complied with.

Power to enter on steamboats, etc.

52. (1) Where there is reason to suspect that any person who has the small-pox, diphtheria, scarlet fever, cholera, or typhoid fever, is in or upon any railway car, steamboat, stage, or other conveyance, the Medical Health Officer, or Sanitary Inspector of the municipality, or, if there is no such officer, any member of the Local Board of Health, may enter such conveyance and cause any such person to be removed therefrom, and may detain the conveyance until it is properly disinfected; or such officer or member may, if he thinks fit, remain on or in, or re-enter and remain on or in, the said conveyance (with any assistants he may require) for the purpose of disinfecting the same, and his authority as a health officer shall continue in respect of such a person and conveyance, notwithstanding the conveyance is taken into any other municipality.

(2) Any member or officer of the Provincial Board of Health, or any medical practitioner authorized by such Board, shall have the like authority.

Isolation of persons infected or who have been exposed to infection.

53. In case any person coming from abroad, or residing in any municipality within the province, is infected, or lately before has been infected with, or exposed to any of the said diseases, the health officers or Local Board of Health of the municipality, where such person may be, may make effective provision in the manner which to them shall seem best for the public safety, by removing such person to a separate house, or by otherwise isolating him, if it can be done without danger to his health, and by providing nurses and other assistance and necessaries for him at his own cost and charge, or the cost of his parents or other person or persons liable for his support, if able to pay the same, otherwise at the cost and charge of the municipality.

Persons recovering from sickness, and nurses to take precautions against spread of disease.

54. Persons recovering from any of the said diseases, and nurses who have been in attendance on any person suffering from any such disease, shall not leave the premises till they have received from the attending physician, or Medical Health Officer, a certificate that in his opinion they have taken such precautions, as to their persons, clothing, and all other things which they propose bringing from the premises as are necessary to insure the immunity from infection of other persons with whom they may come in contact, nor shall any such person expose him or herself in any public place, shop, street, inn, or public conveyance without having first adopted such precautions.

Measures necessary for disinfection to be adopted.

55. All persons named in the last preceding clause shall be required to adopt for the disinfection and disposal of excreta, and for the disinfection of utensils, bedding, clothing and other things which have been exposed to infection, such measures as have been, or may hereafter be, advised by the Provincial Board of Health or by the Medical Health Officer, or such as may have been recommended by the attending physician as equally efficacious.

Notice to be given to person in charge of conveyance in certain cases.

56. No person suffering from, or having very recently recovered from, small-pox, diphtheria, scarlet fever, cholera, measles, or other disease dangerous to public health shall expose himself, nor shall any person expose anyone under his charge who is so suffering, or who has recently recovered from any such disease, in any conveyance without having previously notified the owner or person in charge of such conveyance of the fact of his having or having recently had, such disease.

Conveyance to be disinfected.

57. The owner or person in charge of any such conveyance must not, after the entry of any so infected person into his conveyance, allow any other person to enter it without having sufficiently disinfected it under the direction of the Board of Health or the supervision of the Medical Health Officer, or Sanitary Inspector.

Precautions to be taken respecting clothing, etc.,

58. No person shall give, lend, transmit, sell or expose any bedding, clothing or other article likely to convey any of the above diseases, without having first taken such precaution as the board may direct as necessary for removing all danger of communicating any such disease to others.

Provision of means of disinfection.

59. Any Local Board of Health may provide a proper place or portable furnace, with all necessary apparatus and attendance for the disinfection of bedding, clothing or other articles which have become infected, and may cause all such articles to be disinfected free of charge, or may make reasonable charges for the disinfecting of the same as may be provided by by-law.

Destruction of infected bedding, etc.

60. Any Local Board of Health may direct the destruction of any bedding, clothing or other articles, which have been exposed to infection, and may give compensation for the same.

Houses or rooms occupied by sick persons to be disinfected before being let.

61. No person shall let or hire any house or room in a house in which any of the diseases mentioned in section 46 have recently existed, without having caused the house and the premises used in connection therewith to be disinfected to the satisfaction of the health authorities; and for the purposes of this section the keeper of an inn or house for the reception of lodgers shall be deemed to let for hire part of a house, to any person admitted as a guest into such inn or house.

Persons letting houses not to make false statements as to infectious diseases.

62. No person letting for hire or shewing for the purpose of letting for hire any house or part of a house, on being questioned by any person negotiating for the hire of such house or part of a house as to the fact of there previously having been therein any person suffering from any infectious disorder, or any animal or thing infected thereby, shall knowingly make a false answer to such questions.

R. S. O. c. 191, ss. 5-14, to apply to towns etc. Sec. 3 repealed.

63. The provisions of sections 5 to 14, inclusive, of *The Revised Statute respecting Vaccination and Inoculation*, are hereby extended to towns, incorporated villages, and townships; and section 3 of the said Act is hereby repealed.

Assistance by Constables, etc.

Officer if obstructed may summon assistance.

64. Any member of a legally constituted Board of Health, or any Medical Health Officer or Sanitary Inspector may, when obstructed in the performance of his duty, call to his assistance any constable or other person he thinks fit, and it shall be the duty of every such constable so called upon to render such assistance.

Penal Clauses.

Penalties.

65. (1) Every person violating sections 56, 57, 58, 61, or 62 of this Act shall be liable for every such offence to a penalty of not less than $5 nor more than $50 in the discretion of the convicting Justices or Magistrate, besides costs, which may also be inflicted if the convicting Justices or Magistrate see fit to impose the same.

(2) Any person who violates any other provision of this Act shall, unless it is otherwise specially provided, be liable for every such offence to a penalty not exceeding $20, in the discretion of the convicting Justices or Magistrate, besides costs, which may also be inflicted if the convicting Justices or Magistrate see fit to impose the same.

Recovery of penalties.

66. (1) Every such penalty and every other penalty specified in this Act may be recovered by any person before any two Justices or a Police Magistrate having jurisdiction in the Municipality, and shall be levied by distress and sale of the goods and chattels of the offender, with the cost of such distress and sale, by warrant under the hands and seals of the Justices, or the hand and seal of the Police Magistrate, before whom the same are recovered, or under the hands and seals of any other two Justices having jurisdiction in the municipality, and in default of sufficient distress the said Justices or Magistrate may commit the offender to the Common Gaol or to any Lock-up or House of Correction in the said municipality for any time not exceeding fourteen days unless the amount imposed is sooner paid.

(2) In case any person, from poverty or other sufficient cause, is unable to comply with the provisions of this Act or any of them, he shall give notice of such inability to the medical health officer or Secretary of the Local Board of Health, and in case the Local Board on examination is satisfied of the sufficiency of the cause of such inability, the Secretary thereof shall give his certificate to that effect, and such certificate shall be a bar to all proceedings against such person for the period of six months.

Application of penalties.

67. Every penalty recovered under this Act shall be paid to the treasurer of the municipality in which the offence was committed, for the use of the Local Board of Health and subject to its disposition.

Proceedings not to be quashed for want of form or removed into Superior Courts.

68. No order or other proceeding, matter or thing, done or transacted in or relating to the execution of this Act shall be vacated, quashed or set aside for want of form, or be removed or removable by *certiorari* or other writ or process whatever into any of the Superior Courts, and no appeal shall be had to the General Sessions upon any conviction under this Act.

Application of enactments in Schedule A.

69. (1) The enactments contained in Schedule A, appended to this Act, shall after the first day of July next be in force in every Municipality in this

Province for which there is a Medical Health Officer and a Sanitary Inspector, as a by-law of such Municipality, as if enacted by the Council thereof, except in so far as they shall in the meantime or thereafter, be altered, amended, or repealed by the Council (Schedule B); and the Council of every local municipality shall have authority to pass by-laws from time to time in respect of the various matters dealt with by the said enactments.

(2) In any Municipality which has no Medical Health Officer and Sanitary Inspector, or has only one of these officers, the said enactments shall except as aforesaid, be in force unless so far as they relate to the officer which such Municipality does not possess.

(3) Where two or more Municipalities join in the appointment of a Health Officer or Sanitary Inspector, such officer or inspector shall be deemed to be the Health Officer or inspector of each of the said Municipalities.

(4) Where any act or omission is a violation of any express provision of this Act and is also a violation of a by-law of a Municipality in respect of a matter over which the Council of the Municipality has jurisdiction, a conviction may be had under either the Act or the by-law, but a second conviction shall not be made for the same act or omission.

SCHEDULE A.

Section 69.

By-law in force in every Municipality till altered by the Municipal Council.

Duty of Medical Health Officer.

1. It shall be the duty of the Medical Health Officer to assist and advise the Board and its officers, in matters relating to public health, and to superintend, under the direction of the Board, the enforcement and observance, within this municipality, of Health By-laws or Regulations, and of Public Health Acts, and of any other Sanitary Laws, and, if thought advisable by the Board of School Trustees, to act as Medical Inspector of Schools, as well as advisory officer in matters pertaining to school hygiene, and to perform such other duties and lawful acts for the preservation of the public health, as may, in his opinion, be necessary, or as may be required by the Board of Health. He shall also present to this Board, before the fifteenth day of November in each year, a full report upon the sanitary condition of the district.

Duty of Sanitary Inspector.

2. The Sanitary Inspector, besides performing the duties hereafter indicated by this By-law as belonging specially to him, shall assist the Medical Health Officer, and perform such other duties as may from time to time be assigned to him by the Board of Health or its Chairman.

Chairman of Board of Health to report to Council.

3. The Chairman of the Board of Health shall, before the first day of December in each year, present to the Municipal Council or Municipal Councils, comprised within this district, a report containing a detailed statement of the work of the Board during the year, and the report of the sanitary condition of the Municipality, as rendered to the Board by the Medical Health Officer. A copy of each such report shall be transmitted by the Secretary to the Secretary of the Provincial Board of Health.

Deposits endangering public health forbidden.

4. No person shall within this Municipality suffer the accumulation upon his premises, or deposit, or permit the deposit, upon any lot belonging to him, of anything which may endanger the public health, or deposit upon, on, or into, any street, square, lane, by-way, wharf, dock, slip, lake, pond, bank, harbour, river, stream, sewer, or water, any manure or other refuse, or vegetable or animal matter, or other filth.

Duty of Sanitary Inspector as to roads, etc.

5. It shall be the duty of the Sanitary Inspector to keep a vigilant supervision over all streets, lanes, by-ways, lots, or premises, upon which any such accumulation as aforesaid may be found, and at once to notify the parties who own or occupy such lots or premises, or who either personally or through their employees, have deposited such manure, refuse, matter, dirt, or filth, in any street, lane, or by-way, to cleanse the same, and to remove what is found thereon; such parties shall forthwith remove the same, and if the same be not removed within twenty-four hours after such notification, the Inspector may prosecute the parties so offending, and he may also cause the same to be removed at the expense of the person or persons so offending. He shall also inspect at intervals, as directed by the Board of Health, all premises occupied by persons residing within its jurisdiction, and shall report to the Board each and every case of violation of any of the provisions of this By-law, or of any other regulations for the preservation of the public health, and shall also report every case of refusal to permit him to make such inspection.

Examination of buildings or premises by Sanitary Inspectors.

6. Whenever it shall appear to the Board, or to any of its officers, that it is necessary for the preservation of the public health, or for the abatement of anything dangerous to the public health, or whenever they or he shall have received a notice signed by one or more inhabitant householders of this municipality, stating the condition of any building in the municipality to be so filthy as to be dangerous to the public health, or that upon any premises in the municipality there is any foul or offensive ditch, gutter, drain, privy, cesspool, ashpit, or cellar, kept or constructed so as to be dangerous or injurious to the public health, or that upon any such premises an accumulation of dung, manure, offal, filth, refuse, stagnant water, or other matter, or thing, is kept so as to be dangerous or injurious as aforesaid, it shall be the duty of the Sanitary Inspector to enter such buildings or premises for the purpose of examining the same, and, if necessary, he shall order the removal of such matter or thing as aforesaid. If the occupant, or proprietor, or his lawful agent or representative, having charge or control of such premises, after having had twenty-four hours' notice from any such officer of the Board of Health to remove or abate such matter or thing as aforesaid, shall neglect or refuse to remove or abate the same, he shall be subject to the penalties imposed under section 18 of this by-law.

Notice to put premises in proper sanitary condition or to quit same.

7. If the Board is satisfied upon due examination, that a cellar, room, tenement, or building within its jurisdiction, occupied as a dwelling-place, has become by reason of the number of occupants, want of cleanliness, the existence therein of a contagious or infectious disease, or other cause, unfit for such purpose, or that it has become a nuisance, or in any way dangerous to the health of the occupants, or of the public, they may issue a notice in writing to such occupants, or any of them, requiring the said premises to be put in proper sanitary condition, or if they see fit, requiring the occupants to quit the premises within such time as the Board may deem reasonable. If the persons so notified, or any of them, neglect or refuse to comply with the terms of the notice, every person so offending shall be liable to the penalties imposed by section 18 of this by-law, and the Board may cause the premises to be properly cleansed at the expense of the owners or occupants, or may remove the occupants forcibly and close up the premises, and the same shall not again be occupied as a dwelling-place until put into proper sanitary condition.

Distance of slaughter-house, etc.

8. No proprietor or tenant of any shop, house or outhouse, shall, nor shall any butcher or other person, use any such house, shop or outhouse at any time as a slaughter-house or for the purpose of slaughtering any animals therein, unless such shop, house or outhouse be distant not less than two hundred yards from any dwelling house and distant not less than seventy yards from any public street.

Inspection of slaughter-house.

9. All slaughter-houses within this municipality shall be subject to regular inspection under the direction of the Board of Health; and no person shall keep any slaughter house unless the permission in writing of the Board for the keeping of such slaughter-house has been first obtained, and remains unrevoked. Such permission shall be granted, after approval of such premises upon inspection, subject to the condition that the said houses shall be so kept as not to impair the health of persons residing in their vicinity, and upon such condition being broken the said permission may be revoked by the Board; and all animals to be slaughtered, and all fresh meat exposed for sale in this municipality shall be subject to like inspection.

Inspection of cow byres, cheese-factories and creameries.

10. All milch cows and cow byres and all dairies or other places in which milk is sold or kept for general use, and all cheese factories and creameries shall be subject to regular inspection under the direction of the said Board; and the proprietors shall be required to obtain permission in writing from the Board, to keep such dairy or other place in which milk is sold or kept as aforesaid, or to keep a cheese factory or creamery, and the same shall not be kept by anyone without such permission, which shall be granted after approval of such premises upon inspection, subject to the condition that all such places as aforesaid are so kept and conducted that the milk shall not contain any matter or thing liable to produce disease either by reason of adulteration, contamination with sewage, absorption of disease germs, infection of cows, or any other generally recognised cause, and upon such condition being broken the said permission may be revoked by the Board.

Sale of diseased food.

11. No person shall offer for sale as food within this municipality any diseased animal, or any meat, fish, fruit, vegetables, milk, or other articles of food which, by reason of disease, adulteration, impurity, or any other cause shall be unfit for use.

Supply of drinking water.

12. It shall be the duty of the owner of every house within this municipality to provide for the occupants of the same a sufficient supply of wholesome drinking water; and in case the occupant or occupants of any such house is or are not satitfied with the wholesomeness or sufficiency of such supply, he or they may apply to the Board of Health to determine as to the same: and if the supply be sufficient and wholesome, then the expenses incident to such determination shall be paid by the said occupant or occupants, and if not, then they shall be paid by the owner; and in either case the said charges shall be recoverable in the same manner as municipal taxes.

Wells to be cleaned out, etc.

13. All wells in this municipality which are in use, whether such wells are public or private, shall be cleaned out before the 1st day of July in each year, and in case the Board of Health certifies that any well should be filled up, such well shall be forthwith filled up by the owner of the premises.

Rules respecting disposal of sewage and refuse.

14. The following code of rules and regulations for the disposal of sewage and refuse shall constitute a part of this by-law, and any person or persons violating or neglecting any of the said rules and regulations shall be liable to the fines and penalties imposed by section 18 of this by-law.

Details of establishment of privy vaults, etc., to be approved by Medical Health Officer.

RULE 1.—No privy-vault, cesspool or reservoir into which a privy, water-closet, stable or sink is drained, shall be established until the details of such establishment shall have been submitted to and obtained the approval in writing of the Medical Health Officer, who shall, from time to time, determine with the approbation of the Board, the method of disposal of excreta, sewage and other refuse, to be adopted within the district.

Time deposits to be removed.

RULE 2.—Earth privies or earth closets without a vault below the surface of the ground do not come within Rule 1, but sufficient dry earth, wood-ashes or coal ashes to absorb all the fluid parts of the deposit must be thrown upon the contents of such earth privies and closets daily, the contents when removed from the closet must be placed in a shed or box with rain-proof cover, and removed from the premises at least once a year on or before the fifteenth day of May.

Cleaning out and disinfecting privy vaults, etc.

RULE 3.—If the exigencies or circumstances of the municipality require that privy-vaults, cesspools or reservoirs shall be allowed in accordance with Rule 1, they shall be cleaned out at least once a year, on or before the fifteenth day of May, and from the fifteenth day of May to the first day of November in each year they shall be thoroughly disinfected by adding to the contents of the vault, cesspool or reservoir, once a month, not less than two pounds of sulphate of copper, dissolved in two pailfuls of water, or other suitable disinfectant.

Deodorization before removal.

RULE. 4.—Within the limits of this municipality no night-soil or contents of any cesspool shall be removed unless previously deodorized as above, and during its transportation the material shall be covered with a layer of fresh earth, except the removal shall have been by some "Odorless Excavating Process."

Time for removal of decayed animal or vegetable matter.

RULE 5.—All putrid and decaying animal or vegetable matter must be removed from all cellars, buildings, out-buildings and yards on or before the fifteenth day of May in each year.

Time for removal of garbage.

RULE 6.—Every householder and every hotel and restaurant-keeper or other person shall dispose of all garbage, for the disposal of which he is responsible, either by burning the same or by placing it in a proper covered receptacle for swill and house offal, the contents of which shall, between the fifteenth day of May and the first day of November, be regularly removed as often as twice a week.

Hogs.

RULE 7.—Between the fifteenth day of May and the first day of November, no hog shall be kept within the limits of this municipality, except in pens seventy feet from any house, with floors kept free from standing water and regularly cleansed and disinfected.

Livery stable.

RULE 8.—The keeper of every livery or other stable shall keep his stable and stable-yard clean, and shall not permit, between the fifteenth day of May and the first day of November, more than two waggon-loads of manure to accumulate in or near the same at any one time, except by permission of the Board of Health.

15. The following regulations regarding the construction of houses, shall be in force within this municipality :—

Soil of building sites to be disinfected.

RULE 1.—No house shall be built in or upon any site, the soil of which has been made up of any refuse, unless such soil shall have been removed from such site, and the site disinfected, or unless the said soil shall have been covered with a layer of charcoal, covered by a layer of concrete at least six inches thick and of such additional thickness as may be requisite under the circumstances to prevent the escape of gases into such proposed house.

Ventilation of drains, etc.

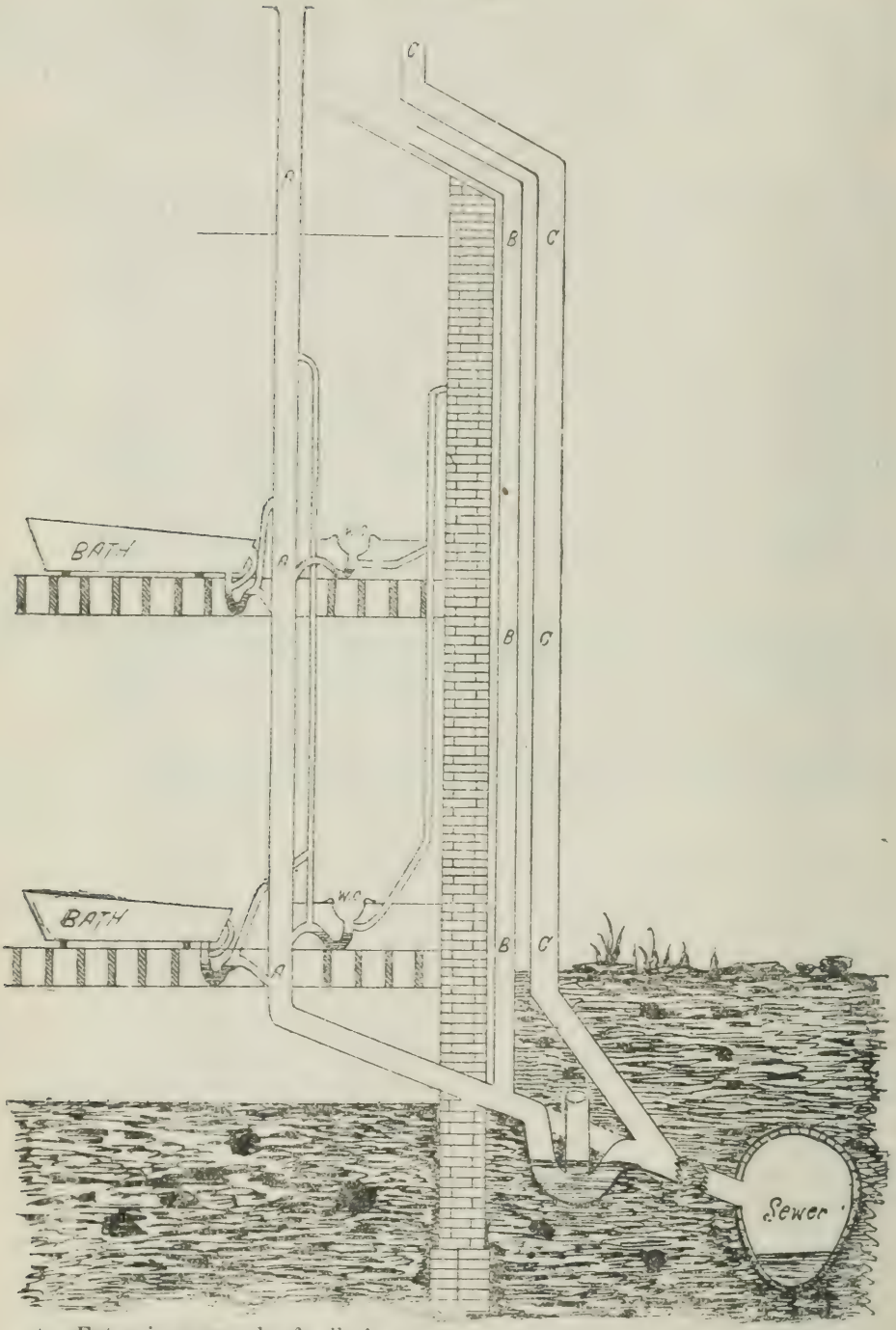
RULE 2.—The drain of every house which may be connected with a sewer or cesspool shall be ventilated by means of a pipe extending upward from the highest point of the main soil or waste-pipe, and also by a pipe carried upward from the drain outside the walls of the house according to the principles shewn in the appended diagram. These pipes shall be of the same dimensions as the said main soil or waste-pipe, and shall be constructed of the same material or of stout galvanized iron, and no trap shall intervene between the said ventilating pipes. In case a trap shall intervene between the sewer or cesspool, and the ventilating pipes already described, then a four-inch ventilating pipe of the same material as above described shall be carried from a point between such trap and the sewer. All such ventilating pipes shall be carried above the roof of the said house, and shall open above at points sufficiently remote from every window, door, sky-light, chimney or other opening leading into any house.

No pipe carrying air or gas from any drain or soil-pipe shall be connected with any chimney in a dwelling-house, unless the same be a furnace chimney used exclusively for the purpose of ventilating such soil-pipe or drain.

Description of drain pipes.

RULE 3.—Every house-drain shall be constructed of vitrified earthenware or iron pipe; and every soil and waste-pipe, of iron pipe rendered impervious to gas or liquids, the joints thereof being run with lead and caulked, or of lead pipe weighing at least 6 lbs. to the square foot; and the waste pipe from every closet, sink, tub, wash-basin, safe or other service shall have as near as may be to the point of junction with such service a trap so constructed, vented and furnished, that it shall at no time allow of the passage of gas into such house. All joints shall be so constructed as to prevent gas escaping through them.

DIAGRAM.



A.—Extension upwards of soil pipe.
B.—Second ventilating tube.
C.—Ventilator for drain in case a trap is placed between the sewer and house.

Certain closets prohibited.

Rule 4.—The construction of any closet or other convenience which shall allow of the escape into the house of air or gas which has been confined in any part of it, or from the drain or soil pipe, is hereby prohibited.

Refrigerator waste.

Rule 5.—No refrigerator waste shall be allowed to connect with any drain.

Pipes supplying water to closets to be disconnected with other pipes.

Rule 6.—No pipe supplying water directly to a water-closet or urinal shall be connected with the pipe supplying water for drinking purposes.

16. Every person who erects or causes to be erected any building shall, within two weeks of the completion thereof, deposit in the Registry Office of the Registry Division in which the building is situated, plans of the drainage and plumbing of the same as executed; and in the case of any alteration of any such plumbing or drainage, it shall be the duty of the owner of the house, within two weeks of the making of the alteration, to deposit in the same manner the plan and record of any such alteration; if such alteration is made by a tenant, it shall be the duty of the tenant or lessee to deposit or cause to be deposited the plan and record of such alteration.

Rules respecting infectious and contagious diseases.

17. The following rules for preventing the spread of infectious and contagious diseases shall constitute a part of this By-law:—

Duties of medical health officer.

Rule 1.—The Medical Health Officer [or Secretary of the Local Board of Health] shall provide each medical practitioner, practising within this municipality, with blank forms on which to report to the said Medical Health Officer [or Secretary] any case of diphtheria, small-pox, scarlet fever, cholerea, typhoid fever, measles, whooping-cough or other disease dangerous to the public health; and also, with other blank forms on which to report death or recovery from any such disease.

Forms, kind of

Rule 2.—All such forms shall be so printed, gummed and folded that they may be readily sealed, without the use of an envelope, so as to keep them from perusal until opened by the Medical Health Officer [or Secretary].

Rule 3.—Said blanks shall be in accordance with the following forms:—

Report of Infectious Disease.

Christian name and surname of patient:
Age of patient:
Locality (giving street, number of house or lot) where patient is:
Name of disease:
Name of school attended by children from that house:
Measures employed for isolation and disinfection:
(Signature of physician):

.....

Report of Death or Recovery from Infectious Disease.

Christian name and surname of patient:
Locality (giving street, number of house or lot) where patient is:
Name of disease:
How long sick:
Whether dead or recovered:
Means of disinfection employed, and when employed:
(Signature of physician):

.....

Notice of disease to be posted up.

Rule 4.—The Medical Health Officer [or Secretary], within six hours after he shall have received a notice of the existence of scarlet fever, diphtheria, small-pox, cholera, or whooping-cough, in any house, shall affix or cause to be affixed by the head of the household, or by some other person, near the entrance of such house a card at least nine inches wide and twelve inches long, stating that such disease exists in the said house, and stating the penalty for removal of such card without the permission of the Medical Health Officer or Board of Health.

Not to be removed.

Rule 5.—No person shall remove such card without the permission of the Board of Health or one of its officers.

Animals affected.

Rule 6.—No animal infected with an infectious or contagious disease shall be brought or kept within this municipality, except by permission of the Board of Health.

Penalties.

18. Any person who violates sections 4, 6, 7, 9, or 11 of this by-law, or Rule 1 of section 15, or Rule 5 or 6 of section 17, shall be liable for every such offence to a penalty of not less than $5 nor more than $50 in the discretion of the convicting Justices or Magistrate, besides costs, which may also be inflicted if the committing Justices or Magistrate see fit to impose the same. Any person who violates any other provision of this by-law shall be liable for every such offence to a penalty not exceeding $20, in the discretion of the convicting Justices or Magistrate, besides costs, which may also be inflicted if the convicting Justices or Magistrate see fit to impose the same. Every such penalty may be recovered by any person before any two Justices or a Police Magistrate having jurisdiction in the municipality, and shall be levied by distress and sale of the goods and chattels of the offender, with the costs of such distress and sale, by warrant under the hands and seals of the Justices, or the hand and seal of the Police Magistrate before whom the same are recovered, or under the hands and seals of any other two Justices having jurisdiction in the municipality, and in default of sufficient distress the said Justices or Magistrate may commit the offender to the common gaol or to any lock-up or house of correction in the said municipality for any time not exceeding fourteen days, with or without hard labour, unless the amount imposed be sooner paid.

SCHEDULE B.

Form of Municipal By-law Amending the Above By-law.

By-law Number —, *entituled* "*A By-law respecting the Public Health By-law.*"

Whereas it is expedient to amend or repeal some of the provisions of the by-law appended to *The Public Health Act, 1884*, so far as the same are in force in this municipality, and to suspend the operation of other provisions of the said by-law.

Be it therefore enacted by the Municipal Council of

1. Section 13 of the said by-law is hereby amended by substituting the "first day of July of every second year" for "the first day of July in each year."

2. Rule 7 of section 14 of the said by-law is amended by striking out the words "and disinfected" at the end of the said rule.

3. Rule 2 of section 15 shall not be in force in this municipality until the First day of January, 1885.

4. Rule 3 of section 14 is hereby repealed.

5. This by-law shall go into force forthwith.

AN ACT TO MAKE FURTHER PROVISION REGARDING THE PUBLIC HEALTH.

Chapter 45 (1885).

HER MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows :

Short title.

1. This Act may be cited as *The Public Health Act, 1885.*

Appointment of Medical Health Officer by municipal councils.

2. Whenever, from the presence of any formidable contagious disease in any locality, the Provincial Board of Health considers the appointment of a Medical Health Officer necessary for the municipality in which such disease exists, or for any neighbouring municipality, and requests the council of any such municipality to appoint a Medical Health Officer, the council shall forthwith appoint a properly qualified medical practitioner, to be Medical Health Officer for the municipality.

By Provincial Board.

3. If a council does not appoint a Medical Health Officer, within five days after a request in that behalf made by the Provincial Board, which request may be served upon the head of the council or its clerk, or mailed to either of such officers by registered letter-post, the Lieutenant-Governor upon the recommendation of the Provincial Board may appoint a Medical Health Officer for such municipality.

Duration of office.

4. Every Medical Health Officer appointed by the Municipal Council shall hold office during the pleasure of the council, and if under the preceding section the Medical Health Officer is appointed by the Lieutenant-Governor, he shall hold office until the first day of February in the year following that in which he is appointed ; Provided always, that the municipal council may at any time, upon a two-thirds vote of its members, dismiss any Medical Health Officer for a neglect of duty ; and the decision of such council shall be final and shall not render the corporation liable for any damages ; the Medical Health Officer shall be entitled to compensation for services actually rendered up to the time of such dismissal, but the amount of such compensation shall not exceed the salary he would have earned up to the time of such dismissal, and if his salary up to such time is paid such payment shall be a bar to any other claim for services rendered.

Compensation in case of dismissal.

Vacancy in office, how filled.

5. Whenever, during the presence of any formidable contagious disease in any municipality or neighbouring locality any Medical Health Officer becomes temporarily or permanently incapable of performing his duties, or resigns his office, or leaves the locality for which he has been appointed, the council shall forthwith appoint another Medical Health Officer in his room.

Case of several municipalities united into one health district.

6. Where two or more municipalities are united into a health district, the provisions of the preceding part of this Act shall apply, except that the power and duty of appointing or removing a Medical Health Officer shall be with the District Board of Health, unless the councils of the municipalities

composing such health district have, previous to any request in that behalf being made by the Provincial Board, united in appointing a Medical Health Officer for such municipalities, and the Lieutenant-Governor may, in case of their default, appoint a Medical Health Officer for such district.

Compensation of Medical Health Officer.

7. In case the appointment of a Medical Health Officer is made by the Provincial Board of Health he shall be entitled to recover from the municipality reasonable compensation for his services.

His powers.

8. Where a Medical Health Officer is appointed he shall possess all the powers and authority possessed by any Health Officer or Sanitary Inspector under *The Public Health Act, 1884*, or any other Act in force, and such Medical Health Officer shall perform all duties imposed upon him by any regulations of the Provincial Board of Health, and the fact that similar duties are by statute imposed upon the Local Board of Health shall not relieve the Medical Health Officer from the performance of such duties.

Suspension of municipal and school elections.

9. (1) In case the Provincial Board of Health reports to the Lieutenant-Governor that on account of the presence in any municipality of an epidemic or contagious disease it would be dangerous to hold an election in such municipality, the Lieutenant-Governor may, upon application by the council of the municipality in that behalf, issue his proclamation postponing the holding of any intended municipal or school election for a period not exceeding three months, and may from time to time further postpone such election if in the opinion of the said board the necessity for postponement continues.

(2) The Lieutenant-Governor may, by his said proclamation, name the days for holding the nomination and polling for the election, but in case no days are named therefor, the council shall, as soon as practicable after the period named in such proclamation, or the last of such proclamations, expires, by by-law name days for the nomination and polling.

(3) In case an election postponed under the provisions of this section is the annual election, or an election of the entire council, or of all the members of a board of trustees or other body, the members of the council, board or other body shall continue to hold office until their successors are elected.

Authority to dispose of refuse, etc., after removal.

10. Where, under the provisions of *The Public Health Act, 1884*, or of any municipal by-law, the Local Board or any Health Officer removes any dirt, filth, refuse, debris, or other thing which is likely to endanger the public health or to become or cause a nuisance, or which is, or is causing, a nuisance, such dirt, filth, refuse, or other thing shall be subject to the disposition of the Local Board or, if the officer is acting under a by-law of a municipal council, shall be subject to the disposition of the council, and the owner of such thing shall have no claim in respect thereof.

Powers for purpose of disinfecting things or persons.

11. Where a Local Board of Health, or any Health Officer, is required or empowered, under any Public Health Act, or under any regulations made thereunder, to disinfect any person or thing, or to isolate any person, such board or officer may use such force and employ such assistance as is necessary in order to accomplish what is required.

47 V., c. 38. s. 3, amended.

12. Section 3 of *The Public Health Act, 1884*, is hereby amended by adding the following thereto as sub-sections 9, 10, 11 and 12.

Inspection of railway stations, steamboats, etc.

(9) For the inspection of railway stations, steamboats, vessels, railway carriages and cars and public conveyances by the Local Board or some officer, and the cleansing, purifying and disinfecting thereof, and anything contained therein when required by such board or officer at the expense of the owner,

occupier, or the person having the care and ordering thereof, and for detaining for this purpose any such steamboat, vessel, railway carriage and car or public conveyance, and anything contained therein, so long as may be necessary, and any person travelling thereby.

Restraining departure of persons and conveyances

(10) For preventing the departure of persons from infected localities, and for preventing persons or conveyances from passing from one locality to another, and for detaining persons or conveyances who or which have been exposed to infection, for inspection or disinfection until the danger of infection is passed.

Sanitary police.

(11) For requiring the appointment of sanitary police to be paid by the municipalities in which they act, for the purpose of assisting and carrying out the health regulations in force in the municipality.

Removal of persons.

(12) For the removal of persons living in infected localities,

47 V., c. 38, s. 8, amended.

13. Section 8 of the said Act is hereby amended by inserting after the words "Local Boards of Health," where these words occur in the said section, the words "or by the Medical Health Officer or sanitary police."

Sec. 9, amended.

14. Section 9 of the said Act is hereby amended by inserting after the words "the Local Boards of Health," the words, "or the Provincial Board of Health."

Sec. 65, amended.

15. Section 65 of the said Act is hereby amended by adding thereto the following additional sub-sections, as sub-sections 2, 3 and 4.

Penalty for violating regulations of Provincial Board of Health.

(2) Any person who violates any regulation of the Provincial Board of Health shall be liable for every such offence to a penalty not exceeding $20 in the discretion of the convicting justices or magistrate, besides costs which may also be inflicted, if the convicting justices or magistrate see fit to impose the same.

Removal of nuisances.

(3) Where any person has been convicted of an offence under this Act, or under any regulation or by-law enacted or in force thereunder, and such offence is in the nature of an omission or neglect, or is in respect of the existence of a nuisance or other unsanitary condition, which it is such person's duty to remove, or is in respect of the erection or construction of anything contrary to the provisions of this Act, or of *The Public Health Act, 1882*, or of any regulation or by-law enacted, or in force under either of the said Acts then, in case the proper authority in that behalf gives reasonable notice to such person to make good such omission or neglect, or to remove such nuisance or unsanitary condition, or to remove the thing which has been erected or constructed contrary to the said Act, regulation or by-law, and default is made in respect thereto, the person offending may be convicted for such default, and shall be liable to the same punishment as was, or might have been, imposed for the original offence, and so on, from time to time, as often as after another conviction a new notice is given and the default continues; and in the case of a third or subsequent conviction, it shall not be necessary in the information, conviction or other proceedings to make any reference to any conviction except the first, or to any notice except that in respect of which the proceedings are then being taken.

Where application in respect of nuisance must be made to High Court.

(4) No determination or order of the Provincial or Local Board of Health for the removal or abatement of any nuisance shall be enforced, except by order of the High Court of Justice, where such removal or abatement involves the loss or destruction of property of the value of $2,000 or upwards, and upon any application to the High Court the order of the Provincial or Local Board shall not be evidence that the matter or thing complained of was or is in fact a nuisance.

ARTICLE II.

SUMMARY OF MINUTES FOR 1884.

FIRST REGULAR MEETING OF THE BOARD.

(First Session.)

WEDNESDAY, FEBRUARY 6th, 1884.

The Board met at 2 p.m., all the members being present.

The minutes of the last meeting having been read and confirmed, various communications were read, action concerning which having been taken, it was moved by Dr. Oldright, seconded by Dr. Rae, and carried: That the Board go into Committee of the Whole on the report of the Legislative Committee. The Committee rose at 6 p.m. and reported progress, asking leave to sit again.

The Board then adjourned till Thursday, at 10 a.m.

(Confirmed) WM. OLDRIGHT,
Chairman.

(Second Session.)

The Board met at 10 a.m., all the members being present, with the exception of Prof. Galbraith.

It was moved by Dr. Cassidy, seconded by Dr. Covernton, and carried: That a special Committee composed of Drs. Oldright, Covernton, Cassidy, Yeomans and Rae, be appointed to prepare the work on School Hygiene, indicated in a communication sent to the Board by the Provincial Minister of Education. By resolution the Board then went into Committee of the Whole on the report of the Committee on Legislation, when, after making amendments to the report, it was moved by Dr. Cassidy, seconded by Dr. Yeomans, and carried: That the report as amended, be received and adopted.

The Board then adjourned till 2 p.m. Friday, the 8th.

(Confirmed) WM. OLDRIGHT,
Chairman.

(Third Session.)

FRIDAY, 8TH FEBRUARY, 1884.

The Board met at 2.30 p.m., the only member absent being Prof. Galbraith.

After the reading of the minutes of the previous session and the consideration of several communications, it was moved by Dr. Rae, seconded by Dr. Yeomans: That a sum not exceeding $50 be devoted to the purpose of defraying the expense connected with a partial course of additional lectures on sanitary subjects in connection with the Canadian Institute—if the proposition meet the approval of the latter body. The motion was carried.

The matter of continuing the weekly disease reports having been considered and discussed, it was moved by Dr. Rae, seconded by Dr. Covernton: That the Publication Committee be requested to consider and report the best means of curtailing the expenses connected with the publication of the Weekly Health Bulletin. The motion was carried.

Thereafter, on motion, it was agreed that copies of all resolutions passed by the London Sanitary Convention, and by the Bathurst and Rideau Medical Association, be transmitted to the Provincial Treasurer, by the Secretary.

The report of the Commission to investigate Typhoid Fever in Luther Village was read and adopted, on motion of Dr. Yeomans, seconded by Dr. Covernton.

After discussion on the bill to be submitted to the Legislative Assembly by the Toronto Tenement Building Association, it was moved by Dr. Cassidy, seconded by Dr. Yeomans, and carried: That the Committee on "Sewage," "Ventilation," and "Contagious Diseases," be a special committee to report at the next meeting of the Board, upon the communication which has been received from the Toronto Tenement Building Association.

The meeting then adjourned to the call of the chair.

(Confirmed) WM. OLDRIGHT,
Chairman.

SPECIAL MEETING OF THE BOARD.

(*First Session.*)

TUESDAY, MARCH 5th, 1884.

The Board met at 11.30 a.m., all members being in their seats but Prof. Galbraith.

The minutes of the last meeting were read and confirmed, out of which various matters arose which occupied the Board throughout the entire Session, when the Board adjourned till Wednesday, at 10 a.m.

(Confirmed) WM. OLDRIGHT,
Chairman.

(*Second Session.*)

WEDNESDAY, MARCH 6th, 1884.

The Board met at 10.30 a.m., all the members being present, as at the first session.

After dealing with communications to the Board, the report of the Publishing Committee was read, and was adopted on motion of Dr. Rae, seconded by Dr. Yeomans, as follows: That the report of the Publishing Committee be received and adopted; and that the Secretary be requested to prepare a scheme for the Monthly Disease reports, and submit it to the Publishing Committee to take action thereon.

The report of the Committee on the Toronto Tenement Building Association was read, and on motion adopted.

Motions were thereafter passed, adopting as read the reports of the Commission of investigation into Malaria along the valley of the lower Grand River, and of the Committee appointed to arrange for and attend the Sanitary Convention at London.

The Board then adjourned till 3 p.m. Wednesday.

CHARLES WM. COVERNTON,
Chairman.

(*Third Session.*)

WEDNESDAY, MARCH 6th, 1884.

The Board met at 3 p.m., and after the reading of the minutes of the previous session, the report of the delegates to the American Public Health Association, in November, was read and adopted.

The report of the Secretary on the Doncaster and Leslieville Fat Rendering establishments of the Messrs. Hallett, and of the Messrs. Harris, was read and adopted, and ordered to be printed in the Annual Report, on motion of Dr. Yeomans, seconded by Dr. Covernton.

Dr. Oldright presented the report on the Richmond Hill Knackery nuisance, and on motion of Dr. Yeomans, seconded by Dr. Cassidy, it was ordered to be printed in the Annual Report.

The following resolution of condolence was moved by Dr. Oldright, Chairman, seconded by Dr. Covernton, and carried :—

"That the Board has heard with deep regret of the death of Dr. Elisha Harris, Secretary of the State Board of Health of New York. In common with all who have watched the progress of sanitary science on this continent and elsewhere, it is painfully sensible of the loss that has been sustained in the demise of this eminent sanitarian : and this feeling is increased by the recollection of acts of personal kindness and assistance extended by him to the delegates of this Board, who visited Albany two years ago."

The resolution also directed that a copy of it be transmitted to the Secretary, or Acting Secretary, of the State Board of Health, with a request that he forward copies to the family of the late Dr. Harris, and to any journals in the State that he may think fit.

The report of the Finance Committee was presented by Dr. Rae, and was, on his motion, seconded by Dr. Cassidy, adopted.

The meeting then adjourned.

CHARLES WM. COVERNTON,
Chairman.

SECOND REGULAR MEETING, 1884—THE ANNUAL MEETING.

(*First Session.*)

MAY 30th, 1884.

The Board met at 11 a.m., the following members being present :—

Dr. Covernton, Chairman ; Dr. Cassidy, Dr. Rae, Prof. Galbraith, and Dr. P. H. Bryce.

The minutes of the previous meeting having been read and confirmed, the Chairman proceeded to read his Annual Address, which, on motion of Dr. Cassidy, seconded by Dr. Rae, was adopted.

A large number of communications were then read and disposed of in regular form.

An Order in Council, appointing the following gentlemen members of the Board for three years, from May 1st, 1884, was read :—

Dr. W. Oldright, Toronto ; Dr. Francis Rae, Oshawa ; Prof. J. Galbraith, Toronto ; and Dr. Peter H. Bryce, Secretary, Toronto.

The reading of numerous communications occupied the attention of the Board till it adjourned to meet at 2.30 p.m.

(*Second Session.*)

MAY 30th, 1884.

The Board met at 2.30 p.m., all the members being present except Dr. Oldright.

After reading other communications, the following motion was carried relative to the publication of the Monthly Health Bulletin :—

Moved by Dr. Rae, seconded by Dr. Cassidy : That the details connected with the Health Bulletin be referred to the Publication Committee and the Secretary, with power to act in the matter.

The Committee on Epidemics presented their report on the recent outbreak of small pox, after the reading of which the Secretary gave important additional verbal information concerning the various cases. A motion then followed, adopting the report as read, and recommending that the Minister of the Department be consulted regarding the proposed action to be taken in the matter. Carried.

Various other matters were then discussed, after which the Board adjourned till 10.30 a.m., Saturday.

(*Third Session.*)

SATURDAY, MAY 31st, 1884.

The Board met at 10.30 a.m., the following members being present :—

Dr. Covernton, Chairman; Dr. Cassidy, Dr. Yeomans, Dr. Rae, Prof. Galbraith and Dr. Bryce.

After reading the minutes of the previous session, the Secretary read various communications.

The Committee on School Hygiene handed in their report, *re* ventilation of proposed High School at Dunnville, which was read and adopted; and, on motion, Dr. Cassidy was appointed a Committee on Ventilation to take charge of the matter, with instructions to report to the Board.

The Secretary then read the report of the investigation into the outbreak of Diphtheria at Smith's Falls during the past winter. On motion of Dr. Yeomans, seconded by Dr. Rae, the report was adopted.

The Secretary having introduced the matter, the following motion, moved by Dr. Yeomans, seconded by Prof. Galbraith, was carried: That the Publication Committee be authorized to arrange for sending to each municipality a specimen blank book for reports, as is required by Sanitary Inspectors for reporting to Local Boards.

It was thereafter moved by Dr. Cassidy, seconded by Dr. Rae: That the Secretary be requested to prepare a circular for notifying Boards whose Secretaries have neglected to report the formation of Local Boards of Health. Carried.

Dr. Cassidy having suggested the propriety of the Board's supplying the Committee on Ventilation with certain instruments for its use, it was moved by Dr. Yeomans, seconded by Dr. Cassidy, and carried: That the Committee on Ventilation be authorized to expend a sum not exceeding $50 in procuring such instruments as may be necessary for the purposes of the Committee.

Discussion having taken place on the drawing up of a specification for the use of municipalities in adopting a system for the dry removal of sewage, it was moved by Prof. Galbraith, seconded by Dr. Bryce, and carried: That this Board prepare a specimen specification for a system of dry removal, adapted to the circumstances of small towns; and that Dr. Bryce be associated with the Committee on Sewage for preparing such specification.

The Board then adjourned till 2.30 p.m.

(*Fourth Session.*)

MAY 31st, 1884.

The Board met at 2.30 p.m., all the members being present except Dr. Oldright.

The reading of the minutes was postponed.

The question of Immigrant Inspection again having been introduced, it was decided that the Secretary communicate with Dr. Tache and the managers of the various railways, concerning the establishment of some comprehensive system for preventing the introduction of infectious diseases by immigrants.

The report of the Finance Committee was then presented, and, on motion of Dr. Rae, seconded by Dr. Cassidy, it was adopted.

The members of the various Standing Committees for the year were appointed on motion of Dr. Rae, seconded by Dr. Yeomans, as follows:—

1. Epidemics: Drs. Covernton and Bryce.
2. Sewage and Water Supply: Dr. Oldright and Prof. Galbraith.
3. Foods, Drinks and Adulterations: Dr. Bryce.
4. Heating and Ventilation of Buildings: Dr. Cassidy.
5. Poisons: Dr. Rae.
6. School Hygiene: Dr. Yeomans.
7. Legislation: Dr. Bryce.
8. Finance: Dr. Rae.
9. Publication: Drs. Covernton, Oldright and Cassidy.

The Board then concluded its session, adjourning to re-assemble at the call of the Chair.

CHARLES WM. COVERNTON,
Chairman.

THIRD REGULAR MEETING OF THE BOARD.

(*First Session.*)

JULY 31st, 1884.

The Board met at 2.30 p.m., the following members being present, Drs. Covernton, Cassidy, Yeomans, Bryce and Oldright.

The Chairman having explained why the Board had been called together at an earlier period than usual, the Secretary read the minutes of last meeting, which were confirmed on motion of Dr. Cassidy, seconded by Dr. Yeomans.

A large number of communications were then read, many of them having reference to the sawdust nuisance, and in reply to the Board's circular on the subject, dated July 24th. After giving the matter due consideration, the Board took up the reports of Standing Committees, when Dr. Bryce read a partial report of the Committee on Epidemics. The partial report having been received, the Board adjourned till 8 p.m.

CHARLES WM. COVERNTON,
Chairman.

(*Second Session.*)

JULY 31st, 1884.

The Board resumed its labours at 8 p.m., there being present: Drs. Covernton, Oldright, Yeomans, Cassidy and Bryce.

The minutes of last session having been read, the reports from Standing Committees were taken up, when Dr. Covernton read the completed report of the Committee on Epidemics, which was adopted on motion of Dr. Cassidy, seconded by Dr. Yeomans.

It was then moved by Dr. Oldright, seconded by Dr. Yeomans, and carried: That the Chairman and Secretary write a letter to the manager of each of the lines of railway passing through the Province, pointing out the necessity of adopting dry earth closets in order to prevent the spread of the infection of Typhoid Fever, Cholera and other diseases from excreta scattered along the track; also, pointing out the feasibility of such a change.

After further formal discussion on measures necessary to be adopted to provide against the advent of Cholera, the Board adjourned, on motion of Dr. Cassidy, seconded by Dr. Yeomans, till 10.30 a.m., August 1st.

CHARLES WM. COVERNTON,
Chairman.

(*Third Session.*)

AUGUST 1st, 1884.

The Board met at 10.30 a.m., the following members being present: Drs. Covernton, Cassidy, Yeomans, Bryce and Oldright.

A number of communications having been read, the Board, on motion of Dr. Bryce, seconded by Dr. Yeomans, went into Committee of the Whole to consider resolutions prepared by the Committee on Epidemics, *re* protection against Cholera.

The Committee arose at 1 p.m. and reported progress.

The Board then adjourned till 2 p.m.

CHARLES WM. COVERNTON,
Chairman.

(*Fourth Session.*)

August 1st, 1884.

The Board met at 2 p.m., there being present: Dr. Covernton, Dr. Oldright, Dr. Yeomans, Dr. Bryce and Dr. Cassidy.

The minutes of the previous session having been read, the Board again went into Committee of the Whole on the Cholera resolutions, and after receiving further consideration they were reported to the Board and adopted, Regulation 10 being inserted as an amendment, on motion of Dr. Bryce, seconded by Dr. Cassidy.

Reports of Special Committees were next considered, when Dr. Oldright presented the report of the Special Committee appointed to enquire into the prevalence of Typhoid at Kingston Asylum, which was received.

It was thereafter moved by Dr. Cassidy, seconded by Dr. Yeomans, and carried: That a Committee, consisting of Drs. Covernton, Bryce and the mover, be appointed to discuss the desirability of measures being taken to prevent infanticide, and suggest means by which the present large mortality among foundlings in this Province be diminished: and that the Committee report at the next meeting.

Subsequently it was moved by Dr. Yeomans, seconded by Dr. Cassidy, and carried: That in the matter of the nuisance complained of by Mr. W. Pruest, of Haliburton, the Chairman and Secretary be authorized to take such measures as will give support to the Local Board of Health, in having the nuisance abated.

The Board then adjourned till 8 p.m.

CHARLES WM. COVERNTON,
Chairman.

(*Fifth Session.*)

August 1st, 1884.

The Board met at 8.30 p.m., the members present being: Dr. Oldright, Dr. Cassidy, Dr. Yeomans and Dr. Bryce.

It was moved by Dr. Oldright, seconded by Dr. Bryce, and carried: That in the case of those municipalities in which it is necessary for the general welfare of the Province, in view of the probable approach of Cholera and because of other Zymotic diseases, there should be active Boards of Health and in which no Boards have been appointed, the Secretary be instructed to write to the Municipal Clerks of such municipalities, drawing their attention to the necessity above referred to, and informing them that unless Boards are forthwith appointed, the Provincial Board will proceed to make appointments under section 19 of the *Public Health Act*, 1884, in all such municipalities.

The report of the Committee on Sewage was thereafter read and adopted, on motion of Dr. Cassidy, seconded by Dr. Bryce.

The Board then adjourned till 10.30 a.m., August 2nd.

CHARLES WM. COVERNTON,
Chairman.

(*Sixth Session.*)

August 2nd, 1884.

The Board met at 10.30 a.m., all the members being present except Prof. Galbraith and Dr. Rae.

A large number of communications, some of which concerned nuisances complained of and others regarding the organization and work of Local Boards of Health, were read.

Resolutions were passed by the Board appointing delegates to attend the Sanitary Conference to be held at Washington, August 7th, and the meeting of the Canadian Sanitary Association at Montreal; and that the gentlemen, delegates to the Sanitary Association, act as delegates to the meeting of the British Association.

Dr. Oldright moved, seconded by Dr. Yeomans: That the Chairman be appointed delegate to the meeting of the American Public Health Association to meet in St. Louis in October next, and that he be also empowered to appoint his co-delegate. Carried.

After discussion of the report on the Kingston Asylum, it was moved by Dr. Cassidy, seconded by Dr. Yeomans, and carried: That the report of the Special Committee on the Sanitary condition of the Kingston Asylum be adopted; and that a copy of the report be transmitted to the Provincial Secretary, through the Inspector.

The meeting then adjourned.

CHARLES WM. COVERNTON,
Chairman.

FOURTH REGULAR MEETING OF THE BOARD.

(*First Session.*)

NOVEMBER 25th, 1884.

The Board met at 2 p.m., the following members being present: Drs. Covernton, Oldright, Rae, Cassidy, Yeomans and Bryce.

The minutes of the last quarterly meeting were read by the Secretary and, after slight amendment, were confirmed.

The numerous communications having been dealt with, the Secretary presented his quarterly statement of business transacted by the Board, and read some of the fullest reports from Local Boards of work done during the year.

Reports of Standing Committees were then taken up, when Dr. Yeomans read the report of the Committee on School Hygiene. It was moved by Dr. Oldright, seconded by Dr. Rae, and carried: That the report be received and adopted, and that a copy of it be made and sent to the Minister of Education.

The session adjourned till 10.30 a.m., Nov. 26th.

(*Second Session.*)

NOVEMBER 26th, 1884.

The Board met at 10.30 a.m., the following members being present:

Drs. Covernton, Oldright, Cassidy, Yeomans, and Bryce.

The minutes of last session were read, together with numerous communications from Local Boards of Health.

The Secretary introduced to the members of the Board, Mr. Symington, of Hamilton, who appeared for the purpose of explaining his system of sewage by upward filtration. After various questions were put and answered, it was moved by Dr. Oldright, seconded by Dr. Yeomans, and carried: That the thanks of the Board be presented to Mr. Symington for his kindness in showing his plans for purifying sewage to the Board. Dr. Oldright next read the report of the Committee on Disposal of Sewage and Water Supply, which, on motion, was received and adopted. The report of the Special Committee, on the means of lessening infant mortality, was read by Dr. Cassidy, and, on motion, was received and adopted.

The meeting then adjourned.

(*Third Session.*)

NOVEMBER 26th, 1884.

Board met at 2.30 p.m., there being present: Drs. Covernton, Yeomans, Bryce, Oldright, Cassidy, and Prof. Galbraith.

After the reading of the minutes, Dr. Covernton read the report of the delegates

to the St. Louis meeting of the American Public Health Association and the Cholera Conference, which was, on motion, received and adopted.

The Secretary read his report on the Almonte investigation, which was adopted, on motion of Dr. Yeomans, seconded by Dr. Cassidy.

Dr. Bryce then presented a special report *re* the sawdust nuisance, which was adopted on motion of Dr. Oldright, seconded by Dr. Yeomans.

The Board adjourned at 6 p.m.

(*Fourth Session.*)

NOVEMBER 27th, 1884.

The Board met at 10.30 a.m., there being present: Drs. Covernton, Oldright, Rae, Yeomans, Bryce and Cassidy.

Communications were received from Dr. Pomeroy, Tweed; and Dr. Dafoe, Madoc, giving favourable reports of the measures taken to limit the smallpox epidemic.

A communication from Dr. Yeomans, *re* a cheese factory in Minto Township, was referred to the Secretary for action.

The Board then went into Committee of the Whole on the question of getting the sanction of the Lieutenant-Governor to special regulations to be adopted by the Board, toward the end of enabling the Board to take more active measures for limiting the smallpox outbreak in Hungerford. After consideration of the regulations the Committee rose and reported progress. The resolutions were adopted by the Board, on motion of Dr. Rae, seconded by Dr. Yeomans. The Board then adjourned.

(*Fifth Session.*)

NOVEMBER 27th, 1884.

The Board met at 3 p.m., there being present: Drs. Covernton, Oldright, Rae, Yeomans, Bryce, and Cassidy.

The reading of the Minutes and the consideration of numerous communications occupied the Board for some time, after which the matter of appointing a delegate to the Washington Cholera Conference was taken up. It was moved by Dr. Yeomans, seconded by Dr. Oldright, and carried: "That Dr. Bryce proceed to Washington to represent this Board at the Conference of State Boards."

The report of the Finance Committee was then read, and, on motion of Dr. Rae, seconded by Dr. Yeomans, was adopted.

The Secretary made a verbal report of the investigation into the pollution of the Waterloo Creek at Bridgeport, which was adopted.

Correspondence from London and neighboring municipalities was disposed of by the following resolution, moved by Dr. Rae, seconded by Dr. Yeomans, and carried:—

"That the Chairman be requested to wait upon the Minister of this Department and inform him that this Board has been requested by the Local Boards of London Township, London East, London City, and London West to investigate certain matters connected with the disposal of sewage in these municipalities; and that the Board considers it to be its duty, in compliance with sec. 36 of *The Public Health Act, 1884*, to accede to such request, if such action meets with his approval; that the chairman be further requested to ascertain whether such action does meet with his approval, and if the reply be in the affirmative, that the question be referred to the Committee on the Disposal of Sewage."

It was thereafter moved by Dr. Yeomans, seconded by Dr. Oldright, and carried:

That the Board would reiterate the opinion that the Secretary should receive a salary sufficient to enable him to relinquish his private practice, and that his whole time

should be devoted to the work of the Board, and that the salary of the chairman should be suitably increased.

Dr. Rae moved, seconded by Dr. Yeomans:

That Dr. Bryce proceed to Tweed and investigate the progress made by the local health authorities in their efforts to prevent the further spread of small-pox, and to give such advice as he may deem necessary. Carried.

It was then moved by Dr. Cassidy, seconded by Dr. Oldright: That the Board adjourn to the call of the Chair. Carried.

(Confirmed),

CHAS. W. COVERNTON,
Chairman.

APPENDIX B.

Article I.

CIRCULAR TO CLERKS OF MUNICIPALITIES, *RE* FORMATION OF LOCAL BOARD.

Office of the Provincial Board of Health.

Toronto, April 9th, 1884.

To the Clerk of the Municipality of ———

Sir.—Enclosed you will find copies of *The Public Health Act of 1884*, for the use of the Council of your Municipality. The Provincial Board of Health would request that the special attention of the Council at the present time be directed to sections 12, 13, 18 and 20 thereof. By a perusal of them you will notice that the Act requires the establishment of a Local Board of Health in your Municipality at the first meeting of the Council after the first day of May next; and also that the names of the members of the Board be forwarded, within a month after such regular meeting, to the Secretary of the Provincial Board of Health.

Section 12 provides that a certain number of ratepayers are to be appointed by the Council. By this it is not to be understood that members of the Council are necessarily excluded from appointment to positions on the Board; but it should hardly be necessary to point out to the Council that it is most desirable that the ratepayers appointed should be persons who are known to have some knowledge of, and interest in, sanitary matters, or who from their profession or calling may be supposed to have such knowledge and interest.

The Board trusts that the importance of section 20 of the Act, in which provision is made for the regular appointment of officers of the Board, will be so apparent to your Council that it will be acted upon, since useful, practical work on the part of the Board, as contemplated by the Act, must largely depend on the appointing of such executive officer or officers.

By reference to section 49 you will observe that every physician is bound under penalty to report every case of Scarlet Fever, Diphtheria, Small-pox, Typhoid Fever or Cholera that he is called upon to attend. You will also see that every physician in your district is to be furnished by the Medical Health Officer [or by the Secretary of the Local Board of Health] with blank forms, as directed in section 17 of Schedule A to the Act. I have therefore to ask you to attend to this matter, or to see that it is attended to, as soon as your Local Board is organized. On pages 6 and 7 of the Second Annual Report of this Board, which will shortly reach you, you will find statements of facts which ought to be convincing proofs of the necessity for making a commencement in this matter without further delay, if such commencement has not already been made.

The attention of the Council is further directed to sections 13 and 15 of *The Municipal Amendment Act, 1884*, whereby powers to pass by-laws for certain sanitary purposes are extended to Township Councils; and new powers are given to all Councils for the regulation of private wells, for the closing of these when found to be polluted, for the licensing of milk vendors (and consequent inspection of their establishments), for the closing of privy pits when found specially injurious to public health, for the regulation of earth closets, etc., and for the notification of infectious diseases.

You will find at the end of *The Public Health Act*, a by-law covering most of the sanitary requirements of every Municipality, and you will find by section 69 of the Act that it is in force in every Municipality—except in so far as it shall be amended or repealed by the Council, and except in so far as relates to officers not possessed by the Municipality.

Trusting that, at the earliest possible date, the provisions of section 18 of *The Public Health Act*, and of the other sections to which reference has been made, will be complied with, so that there may be systematic co-operation with Boards everywhere throughout the Province.

I have the honour to be,
Your obedient servant,

PETER H. BRYCE,
Secretary

ARTICLE II.

CIRCULAR TO SECRETARIES OF LOCAL BOARDS, *RE* ANNUAL REPORTS.

OFFICE OF THE PROVINCIAL BOARD OF HEALTH.

TORONTO, October 21st, 1884.

To the Secretary, Local Board of Health of

DEAR SIR,—With the view of presenting as complete a report as possible of the sanitary condition during the present year of the various municipalities of the Province and with the end of enabling this Board to make such provisions during the coming year, in common with State Boards of Health over the whole American continent, as will be most likely to successfully prevent the invasion of Cholera, and to limit those zymotic diseases always present in our midst, I would request you to bring the matter of preparing an Annual Report before your Local Board of Health at the earliest possible moment, so that the requirements of *The Public Health Act, 1884*, section 24, and of sections 1, 2, 3, Schedule A, may be complied with.

To facilitate the preparation of this report by your Board, and also to make the compilation of so large a number of reports by me as complete as possible, I would request that the questions found on page 148 of the Second Annual Report be followed as nearly as possible; and that in reports by Sanitary Inspectors the method found in the memorandum book supplied to your Board be carried out.

By section 1, Schedule A, it will be observed that the Medical Health Officer's Report is expected to be presented to the Board by the 15th of November. As it is most desirable that the Annual Report of the Provincial Board be issued at the beginning of next year, you will confer a great favour upon me by sending the report of your Board not later than the end of November, so that such report may be completed as soon as possible.

I have the honour to be,
Your obedient servant,

PETER H. BRYCE,
Secretary.

ARTICLE III.

ANNUAL REPORTS OF LOCAL BOARDS OF HEALTH.

NOTE.—The reports have been arranged in alphabetical order; Cities coming first, then Towns, Villages and Townships.

CITIES.

HASTINGS.

Belleville.

CHAIRMAN'S REPORT.

As Chairman of the Local Board of Health, I have made the following report of the work done by the Board during the year:—

"To JAMES W. DUNNET, Esq.,
"Mayor of the City of Belleville:

"DEAR SIR,—In pursuance of section 24 of *The Public Health Act, 1884*, I have the honour to present the following report of the work done by the Local Board of Health for the present year.

"In pursuance of section 28 of the said Act, the Chairman and Inspector of the Board have made personal inspection of 125 yards and water-closets, for the purpose of ascertaining what nuisances existed calling for abatement under the Act, and ordered the cleaning of twenty-three cellars and the emptying and disinfecting of sixty-eight water-closets, also the cleaning and disinfecting of seven pig-pens.

"An inspection of the wells of the city was made, and any found in a bad state were ordered to be cleaned out or filled up.

"During the year ninety-seven complaints of nuisances have been heard and attended to by the Chairman and Inspector, and the nuisances abated.

"The Council's attention was called to the bad state of the police cells in the City Buildings, and ventilators have been put in which will supply better ventilation. The bad state of the cells was, in a great measure, due to the neglect of the police authorities in not having the pails used in the cells emptied, and the cells cleaned out after being used during the night by prisoners.

"Small-pox having made its appearance in the northern townships of the county, proper precautions were taken that it should not reach the city. No case has occurred in the city or its immediate vicinity.

"In view of the possibility of an outbreak of Cholera next year, the Board would strongly recommend the advisability of the Council passing a by-law prohibiting the sinking of any more cess-pools, and adopting the dry earth system for water-closets, the ashes from the coal stoves used during the winter supplying the necessary material for use in the closets. The by-law might also contain a clause prohibiting the keeping of pigs within the city limits.

"The Board would also recommend to the Council the advisability of having the city supplied with a proper system of drainage, and a supply of good wholesome water."

I have the honour to remain, sir,
Your obedient servant,

R. TRACY, M.D.,
Chairman of Board.

SECRETARY'S REPORT.

To Peter H. Bryce, M.D.,
Secretary, Provincial Board of Health, Toronto:

Dear Sir,—In reply to your circular of the 21st ult., and in pursuance of *The Public Health Act, 1884*, I beg to present for your consideration the following report of the sanitary work done during the year, and of the sanitary condition of this municipality.

1st. I was instructed to inform the public that members of the Local Board were appointed to look after each ward of the city, and requesting them to notify such members for the respective wards of any nuisance existing, or the Sanitary Inspector, Richard Taylor, Esq., all of which was done.

2nd. I was further instructed to call the attention of the City Council to the bad state of the cellar under the City Buildings. the better ventilation of the police cells, the construction of a water tank for washing the cells out daily, and asking the Council to provide a dumping ground for refuse, etc., etc., all of which was also attended to.

3rd. The Sanitary Inspector was instructed to fill up a stagnant pool of water on Victoria street; to more effectually drain Cedar street, in Murney Ward; to see to the removal of a dead horse in the Pine Grove, Bleeker Ward; also, the prevention of the use of two old houses on Pinnacle street, in Baldwin Ward, as water closets, and the cleaning up of several water-closets on East Front street, in Ketcheson Ward, all of which matters received the attention of the Inspector, as I am informed and believe.

4th. Through the kindness of the Police Commissioners, the services of the members of the Police force were secured for the serving of the necessary notices required by the Board, and generally to aid the Board in sanitary matters.

5th. The By-Law in connection with *The Public Health Act* was considered by the Board, and sundry amendments suggested to the City Council ere its final passage by that body.

6th. The Sanitary Inspector was instructed to notify the owners of the brewery in Murney Ward either to cart away the washings, or construct a covered drain therefor to the river; and also the owners of all yards and premises on both sides of Front street which he might consider nuisances, within three days, were called upon to abate the said nuisances

7th. The City Council was asked for a grant with which to purchase disinfectants for gratuitous distribution amongst the poorer classes.

8th. A committee was appointed to draft rules of order and the order of business for the government of the Board.

9th. The circulars received from the Provincial Board, *re* Cholera, were handed to the Women's Christian Association for distribution, and also to the authorities of Albert College.

10th. The Sanitary Inspector reports improvement in sundry isolated cases of former defective water closets, the cleaning out of several cellars on Front and Campbell streets, and that the city generally is in a good sanitary condition.

I have the honour to remain,
Your obedient servant,

D. B. ROBERTSON,
Secretary.

Brant.

Brantford.

MEDICAL HEALTH OFFICER'S REPORT.

To the Chairman and Members of the Board of Health:

Gentlemen,—In compliance with the provisions of *The Public Health Act, 1884*, I present my annual report on the sanitary condition of the city.

Under the authority of this Act the Board of Health was organized in the month of May last, and the undersigned was appointed Medical Health Officer; Mr. Thomas McMeans (P. C.) was subsequently assigned to do duty as Sanitary Inspector. The by-law in connection with the Act came into force on July 1st, therefore this report embraces a period of only a little more than four months. For the purpose of attending to the various duties imposed by the Act, and for the greater convenience of the public, I have, with the Sanitary Inspector, attended at the City Clerk's office daily, from two to three o'clock p.m.

The sanitary work done during the short period that the Act has been in force includes the following, namely:—Ninety-seven of the most offensive privy vaults have been opened and cleaned by the city contractor; fourteen condemned, emptied and filled up with earth; four large cess-pools emptied and cleaned; eight large cess-pools condemned, cleaned out and filled up with earth; fifty-seven ash-closets established in place of privy vaults—a further large number will be put in new buildings (which are in course of erection) before the end of the year; thirteen pig-styes condemned and abolished; and the others (which are removed the required distance, 70 feet from dwellings) are regularly cleaned and disinfected. From the canal banks (Water street) a large amount of animal and vegetable refuse, and other garbage, has been removed, and further deposits have been prevented.

The Sanitary Inspector has done much other useful work in inspecting nuisances complained of—causing the removal of garbage from streets and preventing further deposit. The Medical Health Officer has spent considerable time in acquiring information as to the different methods of the disposal of sewage, and as to other sanitary matters. He has made two special visits to Toronto to consult with the Provincial Board of Health on these matters, and has also had the advantage of the opinion and advice of Professor Carpenter, who has taken great interest in the introduction of the dry earth system into towns in England. Professor Carpenter, on his late visit here, expressed his interest in, and strong approval of, the effort to apply this system in Brantford.

The policy of the Board of Health is to introduce the dry earth or ash closet system into general use in Brantford, and it is believed that when the public at large come to understand its advantages, they will co-operate cheerfully with the Board in this important sanitary work. Some of these closets have been in use here several years, and experience has thus far shown that the ample supply of coal ashes may be conveniently used instead of dry earth. The cost of an earth or ash box is much less than that of a privy vault, and the comparatively inoffensive contents may be removed in the day time and with little or no expense, once or twice a year—farmers and gardeners being willing to take them as manure; whereas the emptying of privies is not only expensive, but is extremely offensive, poisonous to the atmosphere, requires to be done at night, and is necessarily dangerous to health.

The most serious matter to consider is the contamination of drinking water. No householder can be sure that his well is not contaminated from some cess-pit, perhaps hundreds of feet, or even yards, distant; and it is well known that at the present time a great many wells in the city are impure. The importance of this matter cannot be over-estimated, especially in a city which, like Brantford, has not a supply of drinking water, except from its wells.

Included in the sanitary work done during the last four months, I refer to the work done on the county premises in the centre of the city. With the cordial co-operation of the county authorities, (for which they are entitled to the thanks of every citizen of Brantford), the whole privy or cess-pool system has been entirely abolished and a plan put into operation, including the dry ash system, which provides for the removal of all solid and liquid refuse at an annual cost of much less than heretofore paid for the mere emptying of the cess-pits. This work shows that the dry-earth system supplemented, in densely built places, by tight ventilated tanks for liquid refuse may, at a very small cost, answer all the needs of the City of Brantford as effectually as a system of sewers constructed and maintained at an enormous cost.

The health of the city for the year has been remarkably good. In the four months covered by this report the number of deaths has been thirty-nine, according to the regis-

tration books of the City Clerk, and as Mr. Woodyatt has taken great pains to secure registration, this undoubtedly includes all which have occurred, and represents an annual death rate of about ten in one thousand. Only four deaths have occurred from Zymotic diseases. This of course is due to the fact that, fortunately, we have escaped an epidemic of any of the contagious diseases.

The sanitary condition of the city at the present time is fairly good—many of the worst nuisances having been abated. Besides all the evils resulting from the closets which yet remain, there also exists the canal. This stagnant pool of water, almost in the heart of the city, must be regarded as a source of danger in case of any serious epidemic breaking out. It has been suggested that this danger might be entirely removed by converting the present stagnant water into a narrow stream—this to be done by filling up a portion, namely, that adjoining the railway track. The land thus reclaimed would, in the opinion of good judges, compensate for the expense incurred. If this evil were removed and the dry earth system brought into general use, Brantford would undoubtedly be in the best sanitary condition of any city in Canada. On account of its close relation to matters pertaining to the public health, I may here properly mention the great boon of a city hospital, so long and anxiously desired, which Brantford has now received from the hands of one of her citizens, Mr. John H. Stratford. Perhaps no city of a similar size in America possesses a hospital so well situated, so handsome, so excellently planned, and completely equipped as this.

It may justly be considered as a matter for congratulation that during the short period of four months, during which the Act has been in force, such an excellent commencement has been made in sanitary work.

In conclusion, I have to thank the Mayor and Council for placing at my disposal the services of so active and energetic an officer as Mr. Thomas McMeans, and the Chairman, members of the Board, and the Secretary, for their cordial support and assistance in the discharge of my duties.

I have the honour to be,

Your obedient servant,

WILLIAM T. HARRIS, M.D.,
Medical Health Officer.

WELLINGTON COUNTY.

City of Guelph.

CHAIRMAN'S REPORT.

GENTLEMEN,—I have the honour to lay before you the first annual report of the Board of Health for the City of Guelph, and which is called for by an Act passed at the meeting of the Legislative Assembly, held in Toronto this year, and which is called the Public Health Act. That Act provides that for each city and town of more than 5,000 inhabitants there shall be a Local Board of Health, to consist of the Mayor and eight ratepayers, to be appointed annually by the Municipal Council, and in accordance with that Act a Local Board of Health was formed on the 27th day of May last, consisting of the following members: His Worship, Mayor Chase, Chairman; members, Messrs. Melvin, Robertson, Hewer, Coffee, Marton, Drs. Keating, Howitt and Nunan, with the City Clerk, as Secretary of the Board.

Since the formation of the Board on the 27th of May last, six meetings have been held, and at its first meeting a motion was made by Mr. Melvin, seconded by Mr. Hewer: That His Worship the Mayor, with Drs. Keating, Nunan and Coffee, with the mover, be a Committee to thoroughly go through the By-law including Schedule "A" of the Act, passed at the meeting of the last Ontario Parliament, and report any amendments or alterations they think necessary. At the next meeting of this Board this was accordingly

done, and at the second meeting, the necessary alterations having been made, it was moved and seconded that the Health By-law, as amended, be submitted to the Council for consideration, and the advisability of passing the same as the Health By-law for the city. Carried.

At the third meeting of the Board eight members were present; also the Sanitary Inspector, from whom a report was received regarding the health of the city. In this report he recommended the cleaning of the creeks running through St. James Ward, and the drain on Priory street cleaned and covered over. Authority was given to the Inspector to have this work done at once. A complaint was also considered with regard to the girls' closet at the Central School, which was in such a position as to cause the water in the well belonging to Mr. Cull to become unfit for drinking purposes. A request was sent to the School Board to have the vault removed, which was at once done. At the third meeting of the Board on the 29th of August, there were eight members present. A somewhat lengthy report was received from the Sanitary Inspector. It was moved and seconded that the report be received and considered at a future meeting. Carried. In this report the Inspector drew the attention of the Board to the water in a large number of wells in the city, which he had reason to believe were contaminated by their close proximity to privy vaults, and asked the Board to have the same examined. He also complains of a number of foul drains, which will require attention, about the city, and strongly recommends that privy vaults be abolished as soon as possible and that the dry earth system be substituted. At a meeting held on the 29th September, at which eight members were present, it was decided to adopt the report of the Sanitary Inspector presented at its last meeting; it was also decided to have the complaint made in that report attended to, and that a competent man be engaged by the said Board to have the water complained of properly examined, and if found unfit for drinking purposes cause the said wells to be closed up.

In conclusion, gentlemen, from what I can learn from the Sanitary Inspector, and also the medical gentlemen of the city, we have cause to congratulate ourselves upon the very healthy state of our city. We have very little sickness at present. There have been during the past year quite a number of cases of Diphtheria, but I am glad to say that very few of them have proved fatal. The recommendations in the report that has been presented to you by the Sanitary Inspector, are in my opinion quite necessary, and should be carried out by this Board. A report will be laid before you by the Inspector, showing the result of the examination of the well-water complained of, and also a report of his work during the past year. I thank you, gentlemen, for your attendance at all our meetings, and for your consideration on all matters brought before you for the benefit of the health of the city.

I am, Gentlemen,

Your obedient servant,

CALEB CHASE (Mayor),
Chairman, Board of Health.

SANITARY INSPECTOR'S REPORT.

To the Chairman and Members of the Board of Health:

GENTLEMEN,—I have the honour to present you with my first annual report as Sanitary Inspector for the city of Guelph. During the past summer I have been kept busy attending to my duties in various parts of the city, and when you come to consider that from the first day of April up to the present time, no less than 320 complaints have been made to me by different persons, and all of which had to be attended to, besides other work, you will readily see that it is no easy matter for one man to attend to the duties that he is called upon to perform. A large number of these complaints were made against persons who are in the habit of keeping pigs; and in every case I quite agree with those who complained, as I consider that keeping these pigs alongside of any person is a very great nuisance, and it is my intention to fully carry out the by-law regarding

them, also slaughter-houses, and those who engage in the business of rendering tallow. Since the first day of March last one hundred and ninety-six closets have been cleaned out by Mr. Hughes, the contractor, at a cost of nine hundred and seventeen dollars ($917.00), all of which has been done very satisfactorily; very few complaints have been made in regard to overcharging by the contractor, as heretofore. The nuisance ground has proved to be of great value to the city during the past season, for in it I have been enabled to bury all dead animals that have been brought to my notice, and at the same time disposed of such nuisances as were not fit to be placed in the quarry holes about the city. The number of dead animals taken out of the river and from off the streets this year has far exceeded that of last; the number taken from the river alone was seventy-four, and this I consider is a very great evil, and one that ought to be remedied. The cost of removing them was $19.00, and the total amount spent by the Board of Health during the past year has been as follows:—

Amount granted by Council to Board		$300
Removing dead animals and other nuisance	$41	
Cleaning out creeks and drains	30	
Expenses to Brantford	4	
Making nuisance boards	15	
Salary for Inspector	100	
Total amount expended		190
Balance to credit of Board of Health		$110

I have visited the schools frequently during the past year, and have found everything about them very clean, but I think that during the winter months the rooms are kept too closely shut up—there is not sufficient air. In a large number of rooms some thirty or forty children are placed in one room, and if the day happens to be a little chilly or cold, the doors and windows are all closed, and then how long is the air in that room fit for respiration? Not more then ten minutes. Then the children have to breathe the same air over and over again; but some people say, "Oh, they are young, they can stand it." I am sorry to say that the life and health of our children do not receive that attention which they deserve, and much mischief comes from the over-estimation of the strength and hardiness of our youth, as it is often in youth that the seeds of invalidism and weakness are planted, and in no other period of life is greater precaution necessary for the preservation of health. Medical and scientific authorities agree that school-rooms should be provided with a space of 1,000 cubic feet of air per pupil, also with means of changing that amount frequently, and it would be well for the teachers themselves if they would pay greater attention to these matters, as a large majority of them injure their own health by not having their rooms sufficiently ventilated; but they should also be careful not to allow the children under their charge to sit near a draft, for although foul air is a slow poison, yet a blast of cold air will do a great deal more harm. The closets and outhouses of the school have all been well cleaned and thoroughly disinfected during the vacation. During the summer Dr. Bryce, the Secretary of the Provincial Board of Health, visited me and gave me a great deal of information regarding sanitary matters as to help me very considerably in the discharge of my duties. The directions for preventing the spread of Asiatic cholera and other contagious diseases, which he kindly supplied me with, were, by the kindness of the daily papers of this city, published for the information of the people, and from my own knowledge it has had great effect upon some who scarcely ever took any interest regarding their yards and outhouses.

Since the medical gentlemen of the city have been supplied with forms for reporting contagious diseases, I have, through the City Clerk, been regularly informed of any such disease that may have taken place in the city, and in all cases so reported I have at once gone to such houses and have taken such steps as I considered necessary for the preventing of the spread of the disease. I have notified the parents not to allow any of their children to attend school until such time as I or they have received a certificate from the

attending physician, that there is no danger from their doing so. I have also notified the teachers not to allow them back until they receive authority from myself. I have also ordered the house were such disease exists to be placarded, in order to prevent others going to visit that house, so that by the house being placarded it announces to all comers that infection is within, and they are shielded from any liability under the common law for concealing the disease and exposing others, and the physician reporting the case is also protected. Some people at first objected very much to have their houses placarded, and considered it a violation of personal liberty, but a little argument soon convinced them otherwise, and they see at once that no man has the natural or acquired right to expose his neighbours to deadly contagious diseases by concealing it in his own house. I have during the summer had occasion to speak to a great many people in the city about the manner in which they disposed of their slops. I have frequently seen some stand at their doors and throw them down not three feet away from them, and at times when the heat of the sun has been so great, the stench that arose from these places was almost unbearable; and besides this it must find its way into the well, as in a great many cases the wells are close to where they frequently throw those slops. In my report for the month of July last, and which was printed in the daily papers, I spoke strongly on this matter, and in the reports which I have received from the medical gentlemen of the city, this is one of their greatest complaints, and they have reported the sanitary condition of the premises as being very bad, but I trust that those who are in the habit of disposing of their slops and refuse in such a causeless manner will soon see the evil of so doing. During the month of September I visited the city of Brantford for the purpose of inquiring into the manner in which they carried on the removal of night-soil, and I found that the system was the same as our own. It was removed by contract and charged for at the same rate as done here, and which appeared to be satisfactory to the people. The soil is removed to a piece of ground just outside the city limits, where it is manufactured and sold at the rate of thirty dollars per ton, and although there are a great many people living in the vicinity of this nuisance ground, there are no complaints made; but such is not the case with us, for although the nuisance ground hired by our contractor for the dumping of the soil, and which is outside of our city limits, and at least 500 yards from any house, complaints have frequently been made, and the contractor has been notified by the Township Board of Health to discontinue the dumping of any more soil at that place, and for that authority they quote section 4 of the by-law, passed at the last meeting of the Ontario Parliament, which reads:—"That it shall not be lawful for any person within the said municipality to permit or suffer the accumulation upon his premises, or to deposit or to permit the deposit upon any lot belonging to him, of anything which may endanger the public health, or to deposit on any public street, square, lane, or on any by-way in front or in rear, or alongside of his building or premises, or in any pond, creek, river, or running stream, any mature or other refuse or vegetable or animal matter, or any other dirt or filth." Now, I consider that there are two ways to look at this. First:—Those who complain must prove in evidence that the depositing of the refuse from the city on the ground rented for that purpose, is injurious to the public health, because if this is enforced, then the question arises where are we to deposit our nuisances. I consider that that part of the by-law should be altered. I have frequently visited the nuisance ground, and on no occasion have I detected anything which I consider injurious to the health of those complaining. During my visit to Brantford I saw a number of the dry earth closets which have been established in that city, through Dr. Harris, the Medical Health Officer, and found they worked well and gave great satisfaction, ashes being used in most cases instead of earth. I was most cordially received by the City Clerk, and every information that I asked for was given me. They are not at present forcing the closing up of the old privy vaults, but in all new houses that are being built the dry earth system is to be used, and I would strongly recommend the same to be carried out here. A note and memorandum book has been supplied me by the Secretary of the Provincial Board, for the purpose of making a house to house inspection throughout the city. I have made only a few of these inspections, as I found that the complaints made kept me busy in attending to them. It is my intention to commence with it as soon as possible, the information obtained by such inspection is as follows:—1st, owner; 2nd, number of house; 3rd, kind of house; 4th,

number of persons in house; 5th, foundation, condition of; 6th, cellar, condition of; 7th, sink and house drain, condition of; 8th, closet, condition of; 9th, premises, condition of; 10th, water supply, condition of; 11th, manufactory, condition of; 12th, school, condition of; 13th, recommendations. 1st visit, 2nd visit, 3rd visit; the recommendations are required to be brought before the Board. I will give you for information the result of my inspection of two houses in the city, one was 949 Woolwich street, a brick house, and which had everything about it to make it comfortable and healthy, the other was No. 7 Preston street, a rough-cast house, cellar damp, not ventilated, closet close to house and near well, and to make matters worse diphtheria was in the house, and as the attending physician stated that it was through the bad state of the building, I at once went to the agent of that house and requested him to have it attended to at once, and also to clean the closet, and as far as possible it was done. I point out this matter to you to show the difference that exists in houses, which are built by gentlemen of means for their health and that of their family, but I am glad to say that the time has come when the law demands those who are building houses for the purpose of renting, that the health and comfort of those who may chance to occupy them be considered. In my report for the month of September, I drew your attention to the filth which was allowed to run into the river from the Alma Block, but up to the present time I have not received any instructions to have the nuisance abated, for the information of the Board and that of the citizens of this city. I give a detailed list of the deaths and their causes from the first day of January, 1884, up to the present time, also the number of births:—

Disease—Consumption, 22; Old age, 14; Still-born, 21; Diphtheria, 6; Dropsy, 1; Pneumonia, 8; Bright's disease, 1; Heart disease, 7; Apoplexy, 1; Burst blood vessels, 1; Disease of Bowels, 5; Convulsions, 2; Spinal Paralysis, 2; Summer complaint, 1; Brain disease, 2; Liver complaint, 2; Cholera Infantum, 1; Bronchitis, 4; Drowned, 2; Typhoid fever, 7; Paralysis, 4; Accident, 2; Dentitio, 1; Softening of brain, 1; Compression of brain, 1; Diabetes, 1; General debility, 2; Tumor, 1; Sciatica, 1; Acute Meningitis, 1; Diarrhœa, 1; Kidney affection, 1; Blood-poisoning, 1; Thrush, 1; Inflammation, 1; Scarlet fever, 1; Gastro-enteritis, 1; Jaundice, 1; Croup, 1; Water on brain, 1; Paralysis of brain, 1; Tubercular Meningitis, 2; Worm fever, 1; Peritonitis, 1; External hemorrhage, 1; Hydrocephalua from birth, 1; Congestion of brain, 1; Poisoned, 1; Disease of liver, 1; Cancer, 4. Total, 149.

One hundred and ten were buried in the Protestant Cemetery, and thirty-nine in the Roman Catholic Cemetery. There were two hundred and sixty-nine births. On the 23rd of October I obtained four samples of water from different wells in the city, and which I had reason to think were contaminated and unfit for drinking purposes; these samples were taken by myself to Professor Hare, of the Ontario Agricultural College, for his examination, and I herewith attach his report. I might state that I was careful in having clean glass stopped bottles which I obtained from the college, and I also took precaution to pump at least two gallows of the water before I took the sample.

Ontario Agricultural College, Nov. 17th, 1884.

To Adjutant Clark, Sanitary Inspector for the City of Guelph.

Dear Sir,—I have completed the analysis of the four samples of city water submitted for examination, and will briefly indicate results as follows:

We found all high in solid matter except No. 3. No. 2 being especially high.

Water that contains 30 or 40 grains per gallon of solid matter has been condemned for drinking purposes; the solid matter was composed almost wholly of carbonates of calcium and magnesium.

No. 1 and 3 gave little chlorine.

No. 2 contained sufficient chlorine, 56 grains per gallon, to indirectly indicate sewage contamination: from the association of chlorine with a high percentage of free and albuminoid ammonia, vegetable as well as animal contamination have made the water of No. 4 impure.

From the free ammonia of drinking water, no inference regarding its impurity can be drawn, unless the percentage of albuminoid ammonia found in each case more than quadruples this percentage: the large percentage in free ammonia in No. 4 absolutely condemns the water. The percentage of albuminoid ammonia in the four waters is high, 0·15 per million, absolutely condemns water for drinking.

The four waters analyzed are unfit for drinking purposes. No. 1 least, No. 4 most. No. 1 might be used without producing serious results; No 2, 3 and 4, especially No. 4, cannot. In the following table the impurities of all four waters are clearly indicated, and from the explanations given above will be easily and intelligently understood :—

Waters Analyzed.	Grains per Gallon.		Parts per Million.		
	Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.	Oxygen Consumed in moist Combustion.
No. 1	31·7	1·6	0·160	0·440	0·7
No. 2	58·0	5·6	0·106	0·441	3·1
No. 3	21·9	0·4	0·132	0·445	0·9
No. 4	30·2	3·2	2·933	0·968	6·0

By this report you will see that the whole four wells are in such a state as not to be considered fit for drinking purposes; the wells are situated in the following parts of the city.

Well No. 1.—Mrs. Armstrong's, London Road.

Well No. 2.—Dublin street, opposite the Central School; this well is used by seven or eight families.

Well No. 3.—Suffolk street; this water was reported to me by Dr. McPhatter, as being unfit for drinking purposes, as he considered that the case of typhoid which he had been treating was brought on by the water.

Well No. 4.—You will see that this is the worst of the four wells, and is reported as quite unfit for drinking purposes, and should be at once closed up; it belongs to the Federal Bank, and is situated on Sunderland street. I would strongly recommend that steps be taken as soon as possible to have something done to these wells, or cleaned out and made fit for use.

In conclusion, gentlemen, I think we may congratulate ourselves on the very healthy state of our city.

I have had great pleasure in performing my duties during the past year; almost every person in the city with whom I have had to deal, most willingly obeyed the instruction given them, and in a very cheerful manner.

I have the honour to be, sirs,

Your most obedient servant,

W. CLARK,

Sanitary Inspector.

P.S.—Since I have completed my Report, I received a notice from Dr. Herod that he had a case of typhoid fever in the family of the late Mr. Taylor, of this city. This case I am sorry to say proved fatal, after a few days' illness. Dr. Herod informed me that he considered the water which this family were drinking was quite unfit for use, and he strongly advised me to have the water from the well examined. I at once took a sample of the water to the Ontario Agricultural College, to Professor Hare, for his examination, and the following is the result.

AGRICULTURAL COLLEGE, Nov. 22nd, 1884.

Analysis of the Drinking Water taken from the well of Mrs. Taylor, George St., City:

We found the solids of this water largely made up of carbonates, and the percentage present but slightly above 40. Though the water is remarkably free from chlorine and free ammonia, the percentage of albuminoid ammonia is high enough *most* strongly to condemn its use. From the small quantity of chlorine and large quantity of albuminoid ammonia, we conclude that this water has been contaminated with vegetable and not animal matter.

SAMPLE.	GRAINS PER GALLON.		PARTS PER MILLION.		
	Solids.	Chlorine.	Free Ammonia.	Albuminiod Ammonia.	Oxygen in Moist Combustion.
No. 5	48·1	3·4	0·325	0·459	1.59

I have the same remarks to make regarding this well as I made of the former ones.

W. CLARKE,
Sanitary Inspector.

WENTWORTH.

City of Hamilton.

CHAIRMAN'S REPORT.

To His Worship the Mayor and Aldermen of the City of Hamilton:

GENTLEMEN,—I herewith respectfully submit my first annual report in accordance with the by-law on Public Health. The general work of the department during this year far exceeds that of any preceding year, both in amount and variety. The ordinary routine of duties has been performed with all the success which could reasonably be expected, while special investigations of much interest have been undertaken, having for their object the examination of the sanitary conditions of houses, yards, etc. The reports covering these investigations will be found in the report of Dr. Ryall, the Medical Health Officer to the Local Board of Health, which accompanies this. Our death rate continues low, when compared with that of other cities of about the same population, and no doubt when the sewers are put in proper condition, will be still lower. It is a matter for thankfulness that, during the past year, the city has not been visited with any widespread cause of mortality or sickness, beyond the ordinary causes which we have almost every year. I regret to say we have had several cases of Diphtheria during the past few months, and a few cases are still reported. The Board has taken every measure to stamp it out; the sewers have been regularly flushed at the heads, and copperas freely used during the dry weather, and every precaution taken to confine it to the houses reported, which we have successfully done in most cases. The blessing of having pure water, which I hope every citizen will soon enjoy, will add greatly to the health of the city. The Board trusts that the Council will not delay in providing a proper ventilation to the public sewers, especially now when so many gully drains are being tapped. This ventilation, so important, so generally absent, and so strangely neglected in this city is producing great discomfort and injury to health. The Board has had all the cow byres and dairies inspected, and found some in a very unclean condition. Certificates were granted to those found to be in proper order according to law, and those not complying were notified to remove them. It is here worthy of remark that the impetus given to sanitary reforms by the new law coming

into force, has been very marked in our city. It has caused the removal of a great number of old-standing nuisances and a general cleaning up, and it is with pleasure I have to remark that the citizens have nobly assisted us to carry out the law. Such a cleaning out of yards (over 900 privies) and cellars has never been done here in the same time before. The Board has had twelve regular meetings, and the attendance of the members has been very satisfactory. I will here mention that during the year the Board has introduced several important measures. First, the scavenger system. The Board put on three single waggons at $2 per day for two months, as a trial, and it has been demonstrated that it was necessary. The tons of garbage, ashes, etc., they have removed would nearly all have been thrown into the streets and public lanes. At the end of this month the Board proposes to change the single waggons to double ones, so that the whole city will be accommodated. Second, the house to house inspection, which has been done by Mr. Peacock in a very satisfactory way, and it was not commenced any too soon, as his reports show. Third, the erection of a furnace to burn up all city refuse, etc., that should not be thrown in any place in the city. The locality where the furnace is situated will require all the ashes, and such refuse that the city will have for years to come.

The following is a statement of the expenditure to 31st October, 1884:

Salaries and labour	$2,086 39
Printing and stationery	247 25
Lumber	58 86
Chemicals and sundries	189 47
	$2,581 97

Respectfully submitted,

WM. S. MORGAN,
Chairman.

MEDICAL HEALTH OFFICER'S REPORT.

To the Chairman and Members of the Local Board of Health:

GENTLEMEN,—In accordance with the by-law on public health, I now present my annual report; the short time which has elapsed since the organization of your Board will not permit me to enter into details as fully as might be expected. It is pleasing to observe that the recent Health Act has produced a salutary effect upon health departments generally, and educates the public to a better conception of what is expected from a civilized community.

During your short period in office, it is worthy to remark that you have introduced measures calculated to be of great public service. I shall allude to them briefly:

The house to house inspection, as far as it has gone, gives a correct history of our general sanitary condition, and will prove a valuable groundwork for future improvement.

The scavenger system, (which I recommended some years ago), you have wisely inaugurated. Meeting as it does with the full approbation of the people, it cannot fail to prove a success, provided that your scavengers are attentive in the performance of their duties. During the winter months a scavenger system is absolutely necessary to prevent accumulations of refuse, ashes, etc. When the spring arrives I feel sure that the benefit derived therefrom will be forcibly demonstrated.

The crematory which is being established will supply a long-felt want for the destruction of city refuse, etc., and is a means likely to be adopted in other parts of our Dominion.

Those three innovations are steps in the right direction, and should be heartily endorsed by our citizens. I look upon them as essentially requisite for the foundation of a good sanitary system.

Placarding houses having contagious diseases therein, may prove valuable as a warning to people who will be advised by it. I doubt, however, that it has the full effect

intended. Isolation cannot be strictly carried out without the co-operation of the medical attendant, where the latter openly pronounces himself opposed to isolation, with the exception of cases of Diphtheria. I presume that your Board will have to take action.

The speedy and private interment of the dead has been satisfactorily attended to.

The placards are given to be posted on receipt of No. 1 notification of the disease from the attending physician, and are not removed until No. 2 notification of recovery or death is received, and not then unless certified that disinfection has been efficiently attended to, and, in cases of death, that burial has taken place. The medical attendant must be responsible for the accuracy of the information given. During the present year to date notifications of 104 cases of Diphtheria have been received, and 30 deaths resulting therefrom. During the same period of 1883 I received only 27 notifications of that disease, and 19 deaths, making a mortality therefrom very alarming. I think that this large proportion of deaths is due to incomplete returns of the number of cases which occurred.

This disease is apparently getting better understood. Of course I don't presume to question the accuracy of diagnosis, but the treatment in some cases is of a remarkably speedy curative nature. I cannot help noticing one case, where the placard was posted, and brought back by the patient in two days after, seemingly nothing the worse of so serious a disease. I gave her a lecture about breaking the law, but did not think it advisable to have her fined $50 for removing the card without permission.

The contagious diseases reported for 1884 to date are as follows :

Measles, 1 ; Scarlet Fever, 26 ; Diphtheria, 104, and Typhoid Fever, 28.

I am led to believe that there are a much larger number of cases of Typhoid than reported.

The disposal of excreta and sewage has become a question of much importance, and being one that your Board must deal with, I therefore respectfully present to your attention the urgent necessity of having the Cathcart-street sewer put into a permanent state of repair as speedily as possible, and also that all sewage and excreta passing through it be intercepted before reaching the inlet. The lowering of the water in the bay will not conduce to our sanitary condition, and continuing the deposit of excreta, etc., into the inlet may be productive of serious consequences.

I would also ask your Board to examine into the principle of interception invented by Mr. Symmington, who would be pleased to furnish you with all its details ; it appears to me exceedingly valuable, and well adapted to the requirements of the city ; its feasibility and advantages can be easily tested on a small scale by applying it to any of our institutions having sewer connection, such as the city hospital, which indeed would require a separate one of its own. Its application might well extend to factories from whence very offensive matter is discharged into the sewers at very uncertain intervals, contaminating our streets and houses with very sickening odors.

I feel convinced that once its efficiency is tested it will meet with universal favour.

I have already cursorily alluded to the inspection made by Mr. Peacock, the extent of which consists of the entire of No. 2 Ward, No. 1 Ward as far as the east side of Emerald-street, No. 3 Ward, King-street, from Park to Bay, No. 5 Ward all south of the railroad, and No. 6 Ward, King-street. Inspector Ford has gone over No. 5 Ward since, at such intervals as he could be spared for that work, and reported what instructions had been attended to. Mr. Peacock has also visited a second time such places as required his special attention in Wards No. 2, 5, and 6, and reported that the following changes had been effected since his first inspection, viz. :

Water closets repaired and new ones introduced	45
Privy vaults cleaned out and filled in	35
Cesspits cleaned out and filled in	17
Cesspits cleaned out	2
Sinks newly trapped	79
Earth privies introduced	9
Refrigerators disconnected from sewers	5

He also reports that the premises generally have a more healthy appearance. He, however, states that some premises and waterspouts remain in a bad condition, making special reference to places on King-street, in No. 6 Ward. I expect that some more active measures will have to be taken in regard to them. He will inspect them again, and if found in a bad condition the matter will be brought to your further notice.

I have not had sufficient time at my disposal to tabulate all the items recorded of premises inspected, but the following will give a pretty accurate idea of our sanitary state.

Premises inspected, 2,761; found dirty, 601; cellars dirty, 196; wet or damp, 39; having sewer connection, 1,181, untrapped sinks, 69; water closets, 1,060; out of order, 37; insufficient water flush, 4; water supply cut off, 14; privy vaults, 1,800; connected with sewers, 63; bad water flush, 60; reported full or bad, 384; to be removed and filled in, 44; earth privies in use, 13; drains of all kinds, 86; common cesspits, 148; well water in use, 52; water complained of, 6; wells used as cesspools, 41; filling in, 17; alleys and lanes dirty at rear of premises, 16; refrigerator waste connected with sewer, 13.

Very few of the drains connected with sewers are trapped, and only a small percentage of houses have sewer ventilation. I would draw your attention to privy vaults connected with sewers without sufficient water supply to flush them out daily. I believe that many of our sewers get choked through this means, and would recommend that all such should be discontinued. I would also bring to your notice that many houses on route of our sewers have not been connected, and the inmates have no proper accommodation for the disposal of sewage, wash water having to be thrown in the yards, in some cases into privy vaults, or on the streets.

Mr. Peacock speaks highly of the earth privy system, having noticed several during his inspection; they appear to me preferable to the common vault, the contents being more easily and speedily removed, devoid of smell if properly attended to. The by-law explicitly demands that dry earth or ashes shall be thrown in daily, in sufficient quantity to absorb all moisture, and when the box is full it can be removed and covered with a rain proof cover, and taken away at leisure, while another box is put in its place. This does away with the objection of freezing in winter, and nothing short of laziness or desire to frustrate the object in view can mar its success.

Before concluding I would suggest to your Board that the house to house inspection be continued during the winter, and that Mr. Peacock continue to work under my instructions.

I would also suggest that your Health Inspectors shall have certain duties allotted to them, so that each may know exactly what he has to perform.

Respectfully submitted,

I. RYALL,
Medical Health Officer.

FRONTENAC.

Kingston City.

SECRETARY'S REPORT.

The Local Board of Health of the City of Kingston has not a Medical Health Officer, but has a Sanitary Inspector who is a member of the Board and acting without emolument, the City Council not having set apart any moneys to defray expenses incurred by the Local Board. Several meetings of the Board have been held and an inspection of the city ordered to be made, which has been done by the inspector and police constables. A regular record of the inspection and cleansing of the city, however, has not been kept, but a complete overhauling is supposed to be gone into in the spring and summer. The privies, water-closets, urinals, etc., are in first-class order. Our general and small-pox hospitals are isolated, the latter being chiefly used as an isolation hospital in cases of epidemic.

M. FLANAGAN,
Secretary.

MIDDLESEX.

London City.

CHAIRMAN'S REPORT.

1. In compliance with the provisions of the *Public Health Act*, 1884, the City Council, on the 19th May last appointed by by-law a Local Board of Health, consisting of the following ratepayers:

His Worship the Mayor, C. O. Hyman, Esq.,
Alderman James Cowan,
" Thomas C. Hewitt,
" Samuel Stringer,
" William Scarrow,
" Dr. James F. Nevin,
Dr. F. B. Wilkinson,
William Saunders, Esq.,
Thomas H. Tracy, City Engineer.

Mr. Saunders declined to act, and Dr. Henry Arnott was appointed in his place. Mr. William Bell, in addition to his other duties as License Inspector and Relief Officer, was re-elected Health Inspector, and with the time at his disposal has proved himself an efficient officer. Chief of Police Williams, and Mr. Wm. Platt, Inspector of water under the Water Commissioners, were appointed Assistant Health Officers without remuneration, both of whom rendered good service in sanitary work

2. Your Board appointed a sub-committee, with power to engage the services of one assistant Health Officer and two constables, who began a thorough and systematic inspection, and for over two months continued their services, visiting almost every house, wells used and unused, cellars, privies, cesspools, and all outhouses, the result of which has been a general cleaning up all round, and which is still in progress.

3. Your Board has much pleasure in reporting the general state of health within the city as good. There has been no epidemic. There was one case of small-pox thrown upon the city by another municipality, which caused no little alarm as well as expense. The patient was cured and discharged after several weeks' confinement. The sewers have been regularly flushed and kept clean, and all refuse and filth injurious to the public health have been removed outside the city limits.

4. Your Board would recommend the removal of the wooden building used as a small-pox hospital, as being totally inadequate for the city's requirements; and should a visitation of Asiatic Cholera take place, we are without any means to cope with it, the grounds around the general hospital being too limited to allow of the erection of the pavilion sheds necessary; besides, the district around the present hospital has of late almost doubled its population, consequently the necessity of removing it to a less inhabited place is more urgent.

5. Your Board has had under its consideration for some time the proper means of removal and disposal of the contents of vaults and closets, etc., and have thoroughly agreed that, considering our position with regard to the sewers, the odorless system is the true one, and we are now in treaty with one of the odorless excavating companies of the United States to introduce a branch of their establishment to this city, which we consider will be a great boon to the citizens, as well as the means of securing a much better sanitary system.

6. The disposal of refuse has also engaged our attention, and the means we suggested is for the city either to purchase or rent a suitable place where all such matter can be deposited, and such as can be incinerated. At present our system is vile, but the limited means at our disposal prevents your Board taking action on this point.

7. Your Board recommends the Council of next year to consider the advisability of appointing a Medical Health Officer, for the Health Inspector having so many duties to perform, it is impossible for him to continue to discharge satisfactorily his functions as a sanitary officer.

8. Your Board regrets having exceeded the appropriation of $500, placed by the Council at its disposal, but when it is known that nearly one-half of that amount was expended on the one case of small-pox, your Board has endeavoured with the limited means at its disposal, to discharge diligently the duties devolving upon them.

All of which is respectfully submitted.

JAMES COWAN, Chairman.
JNO. M. KEARY, Secretary.

CARLETON.

Ottawa City.

MEDICAL HEALTH OFFICER'S REPORT.

In compliance with the requirements of the By-law enforced by Legislative enactment in all municipalities of this Province, I now beg leave to lay before you my annual report for the current year up to the 31st of October. In so doing it affords me much pleasure to have it to state that for the past ten months the medical constitution of your city has been remarkably good, its population having been comparatively free from epidemic diseases generally; and, as will appear by comparative statements here given, notwithstanding our marked increase of population, the total mortality for the last ten months has been less than during the corresponding period of last year. There have been, however, a few cases of Scarlet Fever, occurring sporadically during the spring months; these were generally of a mild type, so were also a number of Typhoid Fever cases, which have made their appearance now and again since the latter part of August last.

So long as our subsidiary drainage is not perfected, and so long as the people are indifferent or neglectful to remedy the defects of house drains that are in many instances worse than no drain at all, we must expect the occurrence of such diseases, as the unavoidable penalty attached to such violations of the laws of health. I cannot lay too much stress on this matter of defective drainage, believing, as I do, that it is one of the most prolific causes of disease. It must be conceded, however, that we are moving in this respect; though slow here as elsewhere the people are to comply with the requirements of the laws of sanitation, I have viewed with pleasure the substantial sanitary improvements achieved during the summer months, in the way of public and private drains.

I very much regret, however, that a scheme put forth with a view of effecting the thorough drainage of St George's Ward had to succumb to adverse interests, and for the time being had to be abandoned. The vital importance of this question of drainage is so well understood by all sanitarians, and it being further a well recognized fact that such works require special supervision, in most cities a properly qualified person is employed to examine all buildings for the purpose of ascertaining whether the drainage and plumbing also have been or are being carried out in conformity with health and sanitary laws. The services of such a person have become indispensable here in this city, when it often occurs that imperfect workmanship, even with the best of material, does insidiously, as it were, sow the seeds of diseases in our midst. I would therefore respectfully urge the securing of the services of such a person, as, in my estimation, would largely contribute to the diminution of preventable diseases among the people.

With regard to the management of contagious diseases, being convinced by experience that isolation is the most effective means of preventing their spread, two hospitals set apart for the reception and care of such cases are maintained at public expense within the city, and I am in justice bound to say, are kept in a good state of efficiency. I beg to call the attention of medical gentlemen practising within the city to the desirability of availing themselves of these institutions whenever the security of the well-being of the community demands it, as it is a well-known fact that effective isolation at domicile in private practice is always a most difficult matter, and in very many instances an impossibility. In connection with this question it affords me much pleasure to record the fact that the public school authorities, actuated no doubt by the consciousness of their responsible position, have caused their truant officer to report all contagious maladies

occurring to any or in the family of any of their pupils, and will not allow the readmission in school of any child from where such diseases have existed, unless previously provided with a certificate from me to the effect that it can be permitted with safety. I regret that I cannot say as much for the vigilance of the separate school authorities. Whether their truant officer reports to them any such cases occurring among their children, I cannot say, but though requested by me to do so, that officer has never reported a case to me, nor have I ever been asked for a certificate by any child for readmission to the separate schools.

I have during the past year been frequently called upon to inspect the condition of dwelling houses rendered unhealthy through defective drainage, and so far as lay in my power had the evil remedied whereever possible. Low-lying lots in various parts of the city, whereon water would accumulate, thereby to a degree becoming dangerous, have been drained whenever situated within reasonable distance of any sewer or drain; but I have been powerless in many instances, owing to the fact that said lots were too far removed from any street drain. In order to prepare for the emergency of the advent of Cholera on this side of the Atlantic, the services of two additional men were secured for the space of one month, by the Board of Health, and these were detailed to make as thorough a house to house inspection as could be made during that time to effect the removal of all objectionable matter from yards and outbuildings by enforcing a general cleansing of the same. Blank books were supplied to these men, and they were instructed to report as follows: The condition of yards, privies, the mode of drainage, if any, and whether or not water was present in the cellar of the dwelling house. It will be readily ceded that it would require two men more than one month to make as thorough a house to house inspection, as would leave nothing to be desired in a city of 30,000 inhabitants. As a proof, however, of the value of the services rendered, 416 privies were reported as needing the services of the night soil removers, 129 yards as requiring the scavenger's cart, and water was reported as existing in 110 cellars, chiefly in the lower parts of Ottawa and By-wards, where there were at the time no street drains available. I gladly record the fact, however, that most of these insanitary conditions have been removed so far as practicable during the last summer. This important matter of the removal of excreta is done here by what is known as the pail and barrel system, which, though not the least objectionable, is the only practicable one where the small privy pit prevails so extensively. The work is done under the supervision of two Inspectors—one for each section of the city—who are careful that it is done in as cleanly a way as possible, being also watchful that the public is not imposed upon in the payment of the same. These officers are also directed to report all defective privy vaults, with a view of causing proprietors to have the same rebuilt in accordance with the health By-law. It is very much to be regretted that more people do not use the dry earth closet, as it is easy of management and, after all, the best in the world in a sanitary and economical point of view, inasmuch as it prevents the pollution of water and utilizes this matter to fertilize the soil, thus serving a double purpose conducive to the welfare of the human family.

It is well that we have a plentiful supply of pure water uncontaminated and beyond pollution by privy pit or cesspool, for, though objectionable, these unfortunately must remain until such time as proper street drains are made in connection with the main sewer; in fact it is better that they should remain than to use for the purposes of water-closets the loosely made dry stone sewer existing in many of our streets. In fact, no permit should be granted to enter these drains for such a purpose.

It is a matter for congratulation that we have this last summer escaped the invasion of Cholera, which is even now making such sad havoc in European countries. We may not be so fortunate next summer, however, as in all probability this terrible pestilence will, with renewed activity, spread to other countries when the frosty winter season is past and gone.

It then becomes the imperative duty of every municipality, aye, and every individual in each municipality, to be prepared for such an emergency in order to be capable of battling with some chance of success against this invading enemy. There must be enforced a general cleansing of the surroundings of the dwelling houses before the hot season sets in next summer, all through the city.

All unhealthy conditions within the house, such as the water in the cellar or the escape therein of sewer gases, should be rectified by the making of proper drains whenever feasible, and properly trapping drains already existing.

The disposal of garbage is a matter of no small importance in every well-regulated household. In order to insure proper disposal of this, and to meet the wishes of many in this respect, I would respectfully recommend the employment of scavenger carts, one or two in each section of the city, to gather and remove this matter, thereby preventing the causation of nuisances on the rear vacant lots, or, as it often happens, on the public street; these carts starting early in May, going their rounds twice or three times a week as the necessity would exist, and thus continue until November. They could also be utilized for the removal of dead animals. There is on the shores of the Rideau River, near the outlet of what was formerly the by-wash, a building used for the purposes of hide inspection, also for the storing of the same. I would strongly urge the removal of this outside the city limits, as it has become an intolerable and a dangerous nuisance to the well-being of the inhabitants of that locality. There are also in that neighbourhood three or four slaughter-houses, the removal of which outside the city limits would in my estimation be conducive to the welfare of the whole community in general, and more particularly to that of the people living in that part of the city. In my opinion no slaughter-house should be further tolerated within the city unless by special permit of the Board of Health, and only where all the requirements and conditions of health by-laws have been complied with.

Tables here attached shew the total mortality from all causes during the last ten months, also the respective mortality in each ward, deaths as occurring among Roman Catholics and Protestants respectively, also according to nationality.

All of which is respectfully submitted.

A. ROBILLARD, M.D.

Cause of Death.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	Total.
Consumption	9	4	5	6	5	9	6	5	6	7	62
Pneumonia	3	7	4	5	4	1	3	1	2	2	32
Bronchitis	1	2	....	2	3	1	1	1	....	1	12
Pleurisy	....	1	....	1	....	....	....	....	....	1	3
Heart Disease	1	1	2	3	2	1	4	....	3	1	18
Scarlatina	1	2	4	....	2	....	....	....	....	....	9
Diphtheria	....	....	....	....	....	....	....	....	....	....	....
Typhoid Fever	1	....	....	1	....	....	1	....	4	2	10
Erysipelas	....	....	....	1	....	....	....	....	....	....	1
Pertussis	....	....	....	....	....	....	....	....	1	....	1
Pyæmia	....	....	....	1	....	....	....	....	....	....	1
Gastro Enteritis	1	....	1	....	....	....	....	....	....	....	2
Apoplexy	....	....	....	1	2	1	2	....	1	2	9
Hepatitis	....	1	2	....	....	1	1	....	1	1	7
Peritonitis	2	2	2	2	2	1	....	1	1	1	14
Cerebritis	3	2	....	1	1	....	2	1	....	....	10
Myelitis	....	....	....	1	....	....	....	....	....	....	1
Meningitis	....	....	....	....	....	....	....	....	1	....	1
Dysentery	....	....	....	....	....	....	....	....	1	....	1
Hydrocephalus	1	2	2	8	3	7	8	5	3	4	43
Croup	1	....	1	1	1	1	1	....	....	1	7
Dropsy	1	1	....	1	1	....	1	3	....	2	10
Nephritis	....	1	....	....	1	....	....	1	....	....	3
Cystitis	1	....	....	....	....	....	....	....	....	....	1
Paralysis	2	1	2	....	2	....	3	1	....	1	6
Asphyxia	1	....	....	....	....	....	....	....	....	....	1
Cancer	1	....	....	....	....	2	1	....	2	....	6
Abcess	....	....	....	3	....	....	1	....	....	....	4
Drowned	....	....	....	2	1	2	....	1	2	....	8
Accidental	1	1	1	1	2	1	....	2	1	1	11
Hæmorrhage	....	....	....	....	1	....	....	....	....	2	3
Infantile Disorders	2	5	10	12	17	26	54	29	23	15	193
General Debility	6	1	4	3	2	6	8	6	2	4	42
Rubeola	....	1	....	....	....	1	....	....	....	....	2
Old Age	2	2	1	3	1	2	3	4	....	3	21
Rheumatism	1	....	....	....	1	1	....	....	....	....	3
Premature Birth	1	....	2	3	1	....	2	1	1	1	12
Still-Born	3	3	....	3	....	2	....	7	3	2	23
Cyanosis	....	....	1	....	2	....	....	....	....	....	3
Asthma	1	1	....	....	....	....	....	....	1	....	3
Scurvy	....	....	....	1	....	....	....	....	....	....	1
Tetanus	....	....	....	....	....	....	....	1	....	....	1
Poison	....	....	....	....	....	....	....	1	....	....	1
Totals	46	40	45	65	58	67	103	70	60	54	608

Deaths According to Nationality.

——	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	Total.
French	15	15	27	29	25	30	59	23	32	27	282
Irish	16	14	8	14	20	19	24	24	8	16	163
English	11	6	7	19	8	17	17	16	15	10	126
Scotch	4	4	3	2	4	1	1	5	5	1	30
German	.....	.....	.....	1	.....	.....	2	2	.....	.....	5
Others	.....	1	.....	.....	1	.....	.....	.....	.....	.....	2
Totals	46	40	45	65	58	67	103	70	60	54	608

Respective Mortality in Each Ward.

Wards.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	Total.
By	12	18	13	23	32	33	38	17	18	15	209
Ottawa	18	6	17	18	13	9	30	18	22	26	177
St. George	7	4	8	12	10	8	15	18	5	6	93
Wellington	8	11	7	12	11	11	16	14	13	6	109
Victoria	1	1	.....	.....	2	6	4	3	2	1	20
Totals	46	40	45	65	58	67	103	70	60	54	608

Respective Mortality Among Roman Catholics and Protestants.

——	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	Total.
Roman Catholics	30	27	37	44	47	53	78	50	41	41	445
Protestants	16	13	14	21	11	14	25	20	19	10	163
Totals	46	40	45	65	58	67	103	70	60	54	608

The total mortality from all causes for the first ten months of 1883 was.....	681
For the corresponding ten months of 1884.....	608
Reduction in total mortality, notwithstanding our increase of population.....	73

Out of the total number of deaths from all causes for the last ten months, one hundred and five (105) occurred in the By Ward Foundling Institution or Bethlehem.

The records of this Institution for the last year, commencing November 1st, 1883, and ending on October last, 1884, show as follows :—

Infants received during the year.....	138
Carried from last year.....	18
	156
Died during the year.....	133
Placed out.....	11
Remaining.....	12
	156

All of which is respectfully submitted,

A. ROBILLARD, M.D.

LINCOLN CO.

St. Catharines.

CHAIRMAN'S REPORT.

In accordance with the provisions of *The Public Health Act*, Sec. 69, Clause 3, Schedule A, I have the honour to present the first annual report of the Local Board of Health, accompanied by the report of the Sanitary Inspector, up to the 15th of Nov., 1884.

As soon as possible after the organization of the Board, 17th July, and the appointment of the Sanitary Inspector, active operations were commenced.

In order that the general public might be conversant with the provisions of *The Public Health Act*, which most concerned them, your Board had extracts from said Act printed in pamphlet form (a copy of which is annexed), and the Inspector has, in the performance of his duty, delivered about 1,300 copies of the same to householders in the city ; in addition to this, the same matter was printed on cards, and placed in hotels, on the market grounds, and in other public places.

From the Sanitary Inspector's report, it will be seen that a house to house visitation has been (or is being) made, and that a large number of complaints have been made of nuisances existing mostly in yards and alleys ; but by the prompt action of the Inspector, these nuisances have been removed.

The Board divided the city into two districts, and have appointed scavengers for both districts. Arrangements for the removal of night soil have also been made, and every effort is now being put forth to have all closets, vaults, cesspools, and like places thoroughly cleansed out, in order that the removal of night soil may be as inoffensive as possible. All vaults are disinfected before being cleaned out, and the contents placed in barrels with tight fitting covers, and taken out of the city limits.

During the hot weather frequent complaints were made to the Board of the foul stench of the open drains on the south side of James street, near St. Paul street, also on the east side of King street, between Helliwell's Lane and James Street. The nuisances which exist at these points are caused by defective grades. On King Street the nuisances complained of are caused by the too free use of water. The occupants of the stores used for the sale of meat should be compelled either to have connections made between their premises and the sewer, or else desist from throwing so much water on the street.

The health of the city during the past year has been good. We have been spared from any epidemic, and, with the exception of Typhoid Fever, have been free from contagious or infectious diseases.

One case of Scarlet Fever (imported) was reported to the Board, but by perfect isolation and the proper use of disinfectants the disease was stamped out.

Diphtheria has not existed in the city since the formation of the Board, but immediately before that period one case which proved fatal had occurred. This case the physician in attendance attributes to bad well-water.

Typhoid Fever has been quite prevalent, but at present no new cases are being reported. The cases reported were as follows:

In August	2
" September	2
" October	14
" November	17
	35

Of these, four have been reported as having terminated fatally. This latter return is not correct, as your Board find from the Board certificates filed with the City Clerk that four additional deaths occurred from Typhoid, making in all eight fatal cases. This discrepancy is caused from the fact that some of the medical men of the city have not made the necessary returns of the result of their cases, as required by the Health Act.

The Board find that the citizens generally are willing to comply with the regulations imposed upon them by the Health Act, and as yet the Inspector has not been obliged to enforce the penalties of the law.

GEO. C. CARLISLE,
Chairman Board of Health.

SANITARY INSPECTOR'S REPORT.

In accordance with the *Public Health Act*, I beg leave to submit the following report of work done since my appointment as Sanitary Inspector by the City Council, on the 27th of July last.

As soon as I entered upon the duties of my office, I made a thorough inspection of all streets, lanes and alleys, and caused the persons who had deposited rubbish or other filth in these places, to remove the same, and where necessary to use disinfectants.

Complaints of nuisances to the number of 290 were made, and on examination many were found to be of a serious nature, and well calculated during the hot weather to be most injurious to the public health. These nuisances were in every case abated, and the premises put in a cleanly condition.

On the receipt of the necessary books, which are published by authority of the Provincial Board of Health, I began a house to house inspection and have visited 331 premises, noting the conditions provided for in the Inspector's book. In many places I found the cellars wet, unventilated, and the foundations in a state of decay.

Very few residences have cess pools or drainage connections with sewers for carrying off house slops, etc., such matter being thrown into the yards filling up the ground with noxious matter, which, through the nature of our soil, must find its way into the wells; and in dry seasons such as the present, no doubt is the cause of much of the sickness and malarial troubles which have prevailed in portions of our city.

The privy vaults, as a rule, I find in a shocking condition; caused the same to be well disinfected, and have ordered them to be cleaned out as soon as the weather will permit.

The thirteen cow-byres, which contain 110 cows, received my early attention; some of these were not well kept, but at present they are all clean and in good order. I have at the suggestion of the Chairman, made a special inspection of the source of water supply for the cattle kept in the byres. I find that ten use well and canal water, and three, city water.

I am happy to state that the fodder provided for the cows is good, and that there are no swill-fed milch cows kept in the cow-byres in the city, but that some cattle are fed on brewer's grains.

Very few milk-sellers have as yet made application for permission to sell milk in accordance with the Act. And I would suggest that the Board take action in this matter at once, in order that all of these persons may come under regular inspection.

After the necessary forms for reporting contagious or infectious diseases were procured, I distributed the same to all the medical men of the city.

I have inspected all the slaughter-houses and butchers' premises, and found them clean and well kept.

I have also been on the market regularly, and have not found any meat, or other article, offered for sale that was unfit for food.

During the season I caused to be removed out of the city 130 h gs ; many of the pens were in a filthy condition, and a great source of annoyance to the neighbourhood in which they are located.

As many of those pens were in close proximity to doors and windows, I caused eighteen pens to be entirely removed, and eight pens to be placed in positions in accordance with the Act. Many of the hogs were running in lots.

Many of the wells are undoubtedly impure, as they are close to cess-pools and privy vaults. On one premises, where three cases of typhoid fever existed, the well was surrounded, within a radius of twenty-five feet, by not less than seven privies.

Out of the 331 premises inspected, I find that 155 use wells; forty-one had no water at all, and the balance use city water.

As the season for cleaning vaults is at hand, and scavengers have been appointed, I propose to see that those places are thoroughly cleaned out, and their contents shall be disinfected before removal.

Thanking you, gentlemen, for your assistance to me in the discharge of my sometimes unpleasant duty,

JOHN C. CLARK,
Sanitary Inspector.

YORK.

City of Toronto.

REPORT OF THE LOCAL BOARD OF HEALTH.

To the Council of the Corporation of the City of Toronto :

The Local Board of Health begs to submit herewith, in compliance with the provisions of *The Public Health Act, 1884*, the Annual Report of the Medical Health Officer, which contains a detailed statement of the work of the Board during the year, and full information as to the sanitary condition of the Municipality.

Respectfully submitted.

JOHN BLEVINS,
Chairman.

MEDICAL HEALTH OFFICER'S REPORT.

To the Chairman and Members of the Local Board of Health :

GENTLEMEN,—I have the honour of submitting the following report upon the sanitary condition of the City of Toronto, in accordance with the requirements of *The Public Health Act*. Such a report, with regard to a city of the dimensions of Toronto, must necessarily be of some length, especially when it is the first report presented ; but in its preparation I have endeavoured, while dealing with the many important sanitary questions, to make it as brief as the importance of the questions considered would permit.

During the summer months eight policemen were detailed to act as Sanitary Inspectors under my instructions and guidance. While thus employed they made a house-to-house inspection, and attended to such complaints as were made to the Medical Health Officer.

The Inspectors thus appointed asked at each place visited the following questions :—

1. May I inspect your house and premises?
2. What is the name of the occupant and owner or agent?
3. What provisions exist for drainage, and what is the condition of the cellar?
4. Is city water in use?
5. Have you water-closets or privies, how many, and what is their condition?
6. Have you a well or cistern in use, or not used, and what is the character of the water?
7. How do you dispose of the kitchen and chamber water?
8. What do you do with the sweepings and refuse of the house from day to day? Are they given to the scavengers regularly?
9. Have you any complaint with regard to your place or neighbouring premises?
10. Do you keep any animals? If so, what is the state of the stables? How often is the manure removed?
11. What is the state of the yard?
12. How many inmates are there?
13. In factories and other industrial establishments, how many men and women are employed? How many hours of work? Have the women separate closets?

The total number of places visited was 5,181, a little over one-third of the number inspected the previous year. The following is a tabulated statement of the results :—

Premises drained	3,471
Premises not drained	1,207
Premises having defective drainage	503
City water in use	4,006
Number of wells	655
Number of foul wells	201
Number of cisterns	842
Number of foul cisterns	228
Number of houses having water-closets	873
Number of privies	3,374
Number of privies drained	684
Number of full privies	814
Number of foul privies	570
Slops thrown in privies	739
Slops and refuse thrown in streets and lanes	668
Number of unclean yards	316
Refuse burnt	858
No water in use	145
Unclean stables	39
Cow byres	52
Dirty cellars	134

Private Drains.—It will be seen that out of 5,181 places inspected, 1,207 had no drainage and 503 had defective drainage. The City Engineer's record shows that in 1883, up to the 27th October, 793 private drains were constructed. During the same period of 1884, 870 private drains had been put in, showing an increase of 77. Drains with sinks for the waste water of the house are essential, not only to keep the yard clean, but also the streets and lanes. When these are wanting the house slops must be thrown either over the yard or into the lane or street, or perhaps a culvert.

Water Supply.—In connection with the 5,181 places visited, 655 wells were found existing, of which 201 were foul. There were 842 cisterns, of which 228 were foul. The foul wells and cisterns ought, obviously, to be filled in. With regard to the wells not

reported as foul, I wish to submit that, although the water may appear pure to the senses of sight, smell and taste, it does not follow that it is not impure and dangerous to drink as reported last year.

In this connection it is desirable to refer to the state of the city water. It would be an outrage to demand a general closing of the wells if the city water be not potable. This Board will remember that Mr. Carpenter, a distinguished scientist of Edinburgh, when here last summer, took samples of water at certain points in the bay, and from the tank at the end of the pier, also from the engine-house well at the water works, and submitted them to a test which he said could be relied upon. Of course it was not necessary that he should tell us the water of the bay is foul; that is well known. But it was of vast importance to know whether the water at the bell-buoy, where the city water is taken, and that in the tank at the shore end of the pipe lying at the bottom of the bay, and in the well of the engine-house were pure, or at least safe to drink. It will be remembered that Mr. Carpenter's report was not satisfactory. He said, "the water as drawn at the bell-buoy is by no means free from contamination by sewage and other organic matter. That this water becomes mixed on its passage from the bell-buoy to the pumping-house with bad water in the bay, probably from breaks in the pipes and in the well at the bay end of the wharf of the pumping house." He also reported the water from the pumping-house well as not free from organic matter. Dr. S. McAdam, another distinguished scientist of Edinburgh, who inspected the water works and water supply, reported that the water he took from the tank and pumping-house well was not pure. Subsequently to these inspections, at the request of Mr. Ald. Walker, I took samples of water at the bell-buoy, at points one mile, two miles, and three miles out in the lake, and submitted them to precisely the same test as that employed by Mr. Carpenter; the result was that the water at the bell-buoy was found as pure as that three miles out in the lake. At the last meeting of the Board I reported: "It will be a cause of gratification to the citizens to know that the water at the bell-buoy is quite as pure as that taken three miles out." But while such was the condition of the water on the day the samples were taken, there is reason to fear that the source of the water supply is not equally good. We cannot be sure that, at certain times, from the action of the wind and currents, the polluted water of the bay does not find its way to the bell-buoy. However this may be, there is sewage poured into the lake west of the western gap. There is the considerable discharge from the Garrison creek, the fort, from the exhibition grounds, and the large amount of sewage from all of Parkdale, which empties into the lake by the Dufferin street sewer. There are grave reasons to apprehend that the aggregate of the sewage poured into the lake west of the bay may flow at times to the bell-buoy, in a sufficiently concentrated form, to render the water impure. Then there is constant danger of leakage of the pipe in the bay. These are considerations of pressing importance which I respectfully submit to this Board. On the 11th of the present month I took samples of water from the engine-house well and the tank at the end of the bay pipe. These were found to be, although not entirely free of organic matter, of such a character that I unhesitatingly say that this water is preferable to any well water in the city. However, in view of the facts I have stated about the possible contamination of the lake water, I am not now prepared to recommend that every well in the city shall be closed. At the same time there are so many obviously foul that some means should be taken to have those which are polluted closed up.

The tables stating the immediate fruit of the Inspectors' work show that 79 foul wells and 94 foul cisterns were filled this summer. But this is not a complete record by any means. At the same time water service has been largely introduced. The Sanitary Police were the means of having city water put in in 62 places, and the water works department shows that water service has been laid during the present season in 2,000 places, being an increase of nearly 240 on the number of the preceding year.

Water and Privy Closets.—In 873 places of the 5,181 visited, closets with water service were found existing. The number of water closets in each place is not given. In the same districts were found 3,874 privies; of these 814 were full and 570 in a foul condition, over and above the ordinary offensiveness of privy pits; and in 739 instances slops and refuse were habitually put in the privies, thereby increasing the foulness.

The question presents itself: in what way shall the excreta of Toronto be disposed of? In considering the question thought must be taken of the future; not remote, but immediate. Everything indicates a very rapid growth in the dimensions and population of this already great metropolis. To continue to pour the sewage into the bay is to place the citizens in constant jeopardy, and invite disease and pestilence to our homes. The assessment for 1885 shows a population of 104,276. Soon Parkdale will be added, with a population of 3,000 making a total of 107,276.

Toronto Bay.—The present condition of Toronto Bay is a disgrace to the city, and calls loudly for attention with such speed as the magnitude of the matter, and the evident difficulties in the way, will permit. The limpid bay of half a century ago, and even many years later, has been converted into what is little better than a cesspool.

The question of the disposal of sewage for Toronto is a problem which shortly must be solved. The city has outgrown the provisions made for the sanitary requirements of civilized life. The fact that last year there existed within the city 14,148 privy-pits alone, shows much requires to be done. And yet, if the yearly contents of these pits be put in the bay, the abomination will be greatly increased. But a privy-pit, except in a rural district or small village, is most objectionable; so much so, that of two evils—retaining the privy-pits, or adding to the foulness of the bay, the last, in point of immediate danger, is the least. The question naturally presents itself: Is it necessary to have either evil? If the sanitary welfare of the city demands that privy pits shall be abolished, what shall the substitute be? The water closet—that is a closet with water service—has been of late rapidly taking the place of the privy. But the earth closet, properly managed, has some important advantages, and is, doubtless, preferable. Water carriage implies a great waste of material extremely valuable as a fertilizer.

There are within a short distance of Toronto waste lands which could, by the aid of this very substance, be made fertile fields. How much better this would be than sending the matter to waste and to poison the water, is quite evident. The earth closet seems to offer the best means of preserving so valuable a fertilizer, and at the same time securing the public against a growing danger, due either to the existence of privy-pits or to the water-carriage system. How far the system can be adopted in Toronto may be questioned. To carry it out effectually, a sufficient quantity of mould or ashes is necessary to absorb all the moisture of the excrement. To supply this and as well remove the resulting manure is thought by excellent authority to be impracticable in a place the size of Toronto. But undoubtedly a large number of houses could be thus treated; the more the better. It is gratifying to know that the number of earth closets is increasing. If we accept this statement that the water carriage system must, at least to some extent, be continued, then something requires to be done to procure other disposal of the sewage than sending it into the bay. This cannot be allowed to continue. It is bad enough now, but when the breakwater is completed, and the eastern gap is reduced to some 500 feet, the channel by which the sewage may be carried out into the lake, and the lake water into the bay, will permit but little commingling of the contents of the bay and the lake water. This, with a rapidly increasing population, must lead to a degree of foulness which cannot be endured. As a remedy it has been proposed to construct intercepting trunk sewers, two or more, extending eastward, by which the sewage may be conveyed to a point where it would not endanger the water supply of the city.

Earth Closets.—In my report adopted by this Board on the 16th September, I pointed out the health value of earth closets as a substitute for water-closets or privy-pits. I have just stated that a high authority regards the universal use of earth closets in a city the size of Toronto as impracticable, but there is reason to doubt the correctness of this view. I have been unable to procure any reports on the subject, but I am credibly informed that in Melbourne, Australia, and in several cities in England, all with a larger population than Toronto, this system has been found to work satisfactorily and with decided benefit. The excreta is all disposed of without causing a nuisance and with a money outlay not burdensome.

The number of earth closets is increasing in the city, but in order that they may come into general use it will be necessary to have a by-law making it compulsory, or to educate

the people to recognize its value. I submit that this Board might consider the best mode of securing this much needed reform.

Deposit of Garbage.—The matter of disposal of garbage is one of great importance. Clause 4 of the By-law says: "No person shall within the municipality suffer the accumulation upon his premises, or deposit, or permit the deposit, upon any lot belonging to him of anything which may endanger the public health, or deposit upon, on, or into, any street, square, lane, by-way, wharf, dock, slip, lake, pond, bank, harbour, river, stream, sewer, or water, any manure or other refuse, or vegetable or animal matter, or other filth."

It is evident from this that the practice hitherto pursued in this matter is now contrary to law; a law fully in accord with the necessary sanitary security of the city. I need not take space to point out the various ways in which such deposits may lead to sickness and fatal disease.

In order to efficiently and safely dispose of the city's garbage, I submit that the plan now coming into use in England, and some places in America, be adopted. The mode is to consume the organic matter by a furnace. This crematorium has been found to answer its purpose in a very satisfactory manner.

The cost of a furnace to fully meet the requirements of Toronto would, I think, be less than $2,000. In Hamilton, where they are in advance of Toronto, the contract has been let for a crematorium at a cost of a little over $700. In consideration of the great benefit as the destruction of matter so highly dangerous to public health when allowed to gradually decompose, the question of cost should not for a moment interfere with the introduction of so necessary an adjunct to the city's welfare.

Slaughter-Houses.—In the month of August the Sanitary Police were instructed to inspect the slaughter-houses in the city, and to ascertain at how many butcher shops any slaughtering was done. From their reports I learned that some of the slaughter-houses were far from being in a proper sanitary condition. They exist mainly in the west end and east of the Don.

Out of all reported upon, only two appeared at all satisfactory. There are a number east of the Don which were not inspected for want of time. But there is one situated at the mouth of the Don, on the west side, which has been visited time and again, to which I wish particularly to refer. On the 6th November I last visited this place. So far as the interior of the building is concerned but little fault can be found. There is slaughtered here from 30 to 35 cattle each week, besides some sheep; the blood and water arising therefrom is all poured into the Don. The construction for holding the offal, which is taken away every night; the box drains, for carrying the blood and frequently pieces of offal to the Don, and the ground around, are all in a very foul state, and a fruitful source of danger to the public health. The space between the building and the stream is considerable, and is all saturated with organic filth. I beg to recommend that steps be taken to have this great evil removed or abated before summer again comes round.

The Inspectors were directed to ascertain to what extent the butchers along the principal streets were in the habit of slaughtering on their premises. I received reports of 15 places; of these it was admitted at five that they killed from time to time calves and lambs. The other ten denied ever doing so.

I submit that no slaughtering should be allowed in connection with the butcher stalls. Saturation of the ground or wooden floor with blood is highly objectionable. Nothing is more dangerous than decomposing blood under such circumstances.

I desire to submit that it would be to the interest of the public health if an abattoir or public slaughtering house were established. This should be situated in a place judiciously selected, and should possess all the appointments necessary to prevent a nuisance, which can be done.

Cow-Byres.—Clause 10 of the By-law directs that: "All milch cows and cow-byres, and all dairies or other places in which milk is sold or kept for general use, and all cheese factories and creameries, shall be subject to regular inspection under the direction of the said Board, and the proprietors shall be required to obtain permission in writing from the Board."

During the last few weeks I have personally visited upwards of 25 places where cows are kept and milk sold. My attention was directed to the number of cows in each place,

their age, state of the udders, nature of food used, when fed and milked, daily quantity of milk, the condition of stable and premises, and the water supply. Of those visited, the stables and premises found in a satisfactory state numbered four, ten were medium, and seven in a bad state. The drainage that is to carry off the fluid excrement was satisfactory in six places, in nine bad, and in eight medium.

With regard to the nature of the food given to the cows little or no fault could be found. Slops from the distillery which were formerly largely used are now given at only three places visited, but grains from the brewery are generally in use. Other articles of food are given, all of which are good. No water alone is given, but it is mixed with bran or shorts. In 13 places city water was used, in six well water, and in three cistern water. Believing, as I do, that there are few, if any, wells of pure water within the city, the use of well water must be condemned, also the use of water from the cistern.

It will be seen that out of the 25 places visited in only six were the premises in a proper condition, and only in nine was the drainage satisfactory. If, however, the law was enforced and no one allowed to keep cows without a written permission from this Board, the most flagrant evils would doubtless be remedied. But I would respectfully submit that cow-byres within a limited area of the city should not be allowed under any circumstances.

Toronto Island.—It requires no argument to show that the Toronto Island as a summer resort for the purpose of obtaining rest and fresh air should be free from everything which might counteract the benefit derived from breathing the pure air from the lake. The population of the island in summer is about 800, besides the large number who may daily visit the place. The quantity of excrement, solid and liquid, derived in this way is considerable, and it becomes a matter of great importance how it shall be disposed of without becoming a nuisance and inimical to the health of the public. On visiting the island in midsummer I found a most offensive nuisance at Hanlan's Point. Under my directions this was removed. The Sanitary Police inspected other parts of the island and found a foul condition of privies in several places. Although these evils were for the time being abated, others will occur next season unless something be done to prevent them. The question is, how shall the excreta be disposed of? To continue to befoul the lagoons and the surface of the island will be most reprehensible. The sand cannot absorb any organic matter, as water is found a short distance from the surface. There is no soil to act upon the solid excreta to render it innocuous. There seems to be only one way to effectually deal with the matter. Every house, public and private, should have an earth closet. The closet should receive both solid and fluid excrement, and a sufficient quantity of mold or earth must be added from time to completely absorb the fluid. By this means foul smells will be prevented, the surface of the island will not be polluted, and at the same time, provided an adequate amount of mold is used, a most valuable product will result, free of offence, which can be used to convert the barren sand into a fruitful garden. In order to secure this most desirable end it would be well to have scows provided for carrying over the earth. The expense attending this would be of little importance compared with the benefit which would accrue to the citizens who look to the island as a place of healthful resort. I beg respectfully to urge this important matter upon the Board of Health. At the same time those living on the island must keep separate the ashes and the refuse of the house, the refuse to be carefully burned, while the ashes could be put in the earth closet.

Requirements of the Medical Health Act.—I beg respectfully to draw the attention of the Board to the 28th section which says: "It shall be the duty of every Local Board of Health to cause to be made from time to time inspection of its district in order to prevent the accumulation within the district of any dirt, filth, or other thing which may endanger the public health, and with a view to ascertain what nuisances exist calling for abatement under the powers of this Act, or of the Revised Statute respecting the public health, and to enforce the provisions of this Act and the said Revised Statute in order to abate every such nuisance."

The systematic inspection during the summer by the Sanitary Police was accomplished by favour of the Chief of Police. They were liable to be withdrawn at any time, in fact were withdrawn during the period of the Exhibition, and a few weeks later were again

withdrawn before their sanitary work was half completed. It seems evident that this uncertain way of inspection by policemen, who are by no means under the control of this Board or its officers, does not meet the explicit requirements of the Act. It is submitted that the City Council should furnish the necessary means for this Board to make the inspection, and enforce the law in accordance with the Health Act.

Inspection of new houses.—The necessity of having systematic inspection of new houses is obvious; several cases have come under my notice this year where new tenement houses were deficient in drainage and properly constructed privies, and in many other respects.

By-law 14, Rule I., says that: "No privy, vault, cesspool, or reservoir into which a privy, water closet, stable, or sink is drained, shall be established until the details of such establishment shall have been submitted to and obtained the approval in writing of the Medical Health Officer."

This requirement of the Act has been quite neglected so far, and the law in this respect cannot be enforced until the Medical Health Officer is supplied with regular inspectors. This By-law, however, should be altered so as to forbid the construction of such pits altogether.

In the matter of plumbing, there should be a By-law requiring the plumber to submit his plans to this Board for approval, and to be kept on file for reference. This work should not be covered until inspected by a competent person, and all pipes and appliances should be so placed that they can easily be inspected at any time. Not a few instances have come under notice in which the most culpable negligence has been discovered. Without any reflection upon the plumbers as a class, it is most necessary to have such inspection and provision. Some plumbers are ignorant of the principles of correct plumbing; but there are also plumbers who wilfully deceive, and become really guilty of manslaughter. Sometimes those who pretend to know the most about sanitary plumbing, and advertise themselves as sanitary plumbers, are the worst offenders.

A number of persons engaged in the business of buying and curing the fresh hides of animals conduct it in places where, during the summer months, it can hardly fail to be a nuisance to many, not only the neighbours, but passers-by. Many complaints have been made of these places. Efforts, I know, are made to keep them in a sanitary condition, but without avail. I submit that a by-law should be passed forbidding the receiving of green skins, except in places approved of by this Board or the Medical Health Officer, between the 1st of May and 1st of October.

The Cholera.—The recent outbreak of cholera at Paris is a warning to the American continent as well as to Europe. If the disease reaches America it is almost certain to visit Toronto. I cannot allow the fear of being considered an alarmist to prevent this note of warning. I may use the words of Sir Robert Rawlinson, C. B., President of the Sanitary Institute of Great Britain, in his opening address at Dublin, on the 30th September last. What he says of certain places in England and Ireland unfortunately applies to Toronto: "The seed-beds of cholera have not been cleansed; the crowded tenements have not been lime-washed and ventilated; the filth-sodden, corrupt surfaces and sub-soils remain occupied; and polluted water is used. Attempting to shut out the cholera from such areas is attempting the impossible." At the same time he said, "In commenting on cholera it must not be forgotten that this disease is not so destructive as the ever-present fever under its various forms. Typhoid is answerable for more deaths than cholera."

WM. CANNIFF,
Medical Health Officer.

TOWNS.

Waterloo County.

Berlin.

MEDICAL HEALTH OFFICER'S REPORT.

In congratulating the municipality in the formation of a Local Board of Health, agreeably to the desire of the Provincial Board, I am of opinion that to facilitate their labours, and render the necessary duties of each member as light as possible, the report of the Medical Health Officer upon the sanitary condition of the town will be desirable. I therefore beg to lay before you a statement of my experience and impressions during the last summer. They are generally amongst the foremost in urging proper legislation for the preservation of health in Berlin.

As it has been demonstrated that to dampness in habitations and localities the beginning of consumption can be very frequently traced, and as this is probably the most important disease we have to contend with in Canada, it cannot be too strongly impressed upon the minds of the people that as subsoil dampness makes the site of any habitation incompatible with comfort and the duration of life, the first care in the preparations of the abodes of man should be proper drainage of the soil. It is to be feared, too, that underneath some of the houses of the town, there is, if not collections of water, a certain chronic dampness that is surely fraught with untold danger—so many persons unconscious of its proximity ; diseases of almost every kind can be traced to this source and I would warn heads of families to look well into the matter and make the exclusion of dampness one of their first household duties. It is very desirable to impress upon householders that there is great danger in connecting house-drains, water-pipes, etc., with a sewer or general drain without a proper trap, as if not properly protected by the trap obnoxious gases will find entrance into the dwelling by means of the said pipes, etc. The water supply of Berlin is a possession of which a great many feel proud, but I may venture an opinion upon this matter. It is a well-known fact that sickness may be caused by drinking impure water, and as really pure water is never found in nature, the next thing to be done is to secure the best we can. Wells at any time, and particularly those in thickly populated towns, are always polluted, as the porous earth is continually absorbing filth, which, if explained at length would horrify those at present ignorant of the fact ; and this is continually soaking into the "splendid well" so frequently spoken of by many, which may contain the products of decomposing nitrogenous matters as well as the specific germs of disease that may have filtered from neighbouring privies. Well water may be bright, cool and sparkling, and yet contain those matters which are a frequent cause of bowel complaints, Typhoid Fever, etc. Therefore, I would strongly recommend all parties having wells in use to see that they are properly cleaned out as well as thoroughly secured at the entrance, and as far removed from any cess-pool, privy, etc., as possible, (as the idea that water filtering through the earth renders it pure is an erroneous one), until a proper supply outside of wells can be secured by the people ; and I feel confident that the Council at no very distant day will see fit to have a proper supply of pure water supplied to the town in order to keep pace with our rapid growth and general prosperity.

Another important matter, which should in no case be overlooked, is the removal of excreta. True, quite a number of our residents have adopted the earth closet and there can be no doubt that with our limited supply of water these are the most suitable for our towns, generally. Quite the largest proportion of our inhabitants still retain the old style of privy-pit, and nothing is a greater hindrance to sanitary perfection than this, as in most cases they cannot be properly cleaned and disinfected. Therefore I would impress upon every householder most forcibly that the old style of privy-pit should be entirely discarded and the earth closet brought into use exclusively. The disposal of garbage is

another important matter, in which every householder should be interested, and although steps have been taken by quite a number of the residents to have this properly stored and removed, still, I have seen in a great many instances it is carted about the streets in open vessels, which, to say the least, looks very disgraceful. The Board of Health deserves great credit for their untiring energy in spite of strong opposition, in succeeding in having one of the most dangerous and at the same time disagreeable nuisances, viz., the slaughter houses, removed outside of the corporation.

Berlin has three splendid schools, and it speaks volumes for the vigilance and care of the head masters and teachers that they have succeeded in excluding contagious and infectious diseases. The precautionary steps taken by the authorities have been so far successful, that contagious diseases have been almost unknown to us; and although solitary cases have been known, in no instance has the infection spread. I cannot conclude this report without paying a tribute to Mr. Charles Quirmbach, the Health Inspector, for the zeal he has displayed in looking after the sanitary condition of the town, and having nuisances removed with all available rapidity within his power.

H. G. LACKNER, M.D.
Medical Health Officer.

Northumberland and Durham.

Bowmanville.

SECRETARY'S REPORT.

I regret that your circular of 21st October has received no notice till now. It was referred to the Chairman of the Board, and he has been from home.

We have but little to report from this town. A Board of Health has been maintained here for a number of years, and it has been customary to make a pretty thorough inspection of the town once a year, as soon as the ground was settled in the spring, and see that offensive and injurious matter was removed, and to give prompt attention to any complaints made at other times; but besides re-organization of the Board, pursuant to the provisions of the Act of last session, it has not been deemed necessary to do anything in addition to what was done in former years, as this is an unusually healthy town. Next year the Local Board will doubtless be prepared to enter into any general measures that may be deemed necessary to fortify the country against the dreaded approach of Cholera.

R. WINDATT,
Secretary.

Peel.

Brampton Town.

SECRETARY'S REPORT.

Board legally constituted. Appointed an Inspector who had thoroughly examined the greater portion of the town, and regularly made a report in the note book and attended all the meetings of the Local Board, giving explanations, and his advice in several instances. He receives $2 per day.

We have not appointed a Medical Health Officer, although we have a physician on the Board.

The Board is satisfied of the sanitary condition of this town as compared with many others. It has been properly attended to by the Board and by the Inspector. I find written up in the note book (60) cases with the various replies, filled in pretty fairly, which book will be forwarded to you if you say so.

JOHN McCULLA,
Secretary.

KENT.

Chatham.

SECRETARY'S REPORT.

Mr. Edward Robinson was appointed Chairman of the Board.

The Secretary was instructed to apply to the Provincial Secretary for more copies of the Health Act, also some pamphlets *re* disinfectants.

The Secretary was instructed to recommend to the Town Council the appointment of the police as Sanitary Inspectors.

It was ordered that the Sanitary Inspectors make a general inspection of the town and report to this Board at the next meeting of any violation of the sanitary laws, and that if the police be appointed as such Sanitary Inspectors, the Chief shall keep a book in which to enter all complaints against sanitary laws.

The Secretary was instructed to procure the necessary number of notices for distribution among the physicians to report cases dangerous to public health.

The Secretary was instructed to request the Council to appoint a public scavenger.

The Secretary was instructed to procure a book in which complaints can be entered respecting nuisances.

The Inspector was instructed to distribute the pamphlets respecting disinfectants.

The Secretary was instructed to procure ten copies of the several copies of the minutes of the orders or instructions issued by the Provincial Board of Health.

It was resolved to petition the Council to provide immediately a suitable place for the reception of night soil, and all other refuse that may be found necessary to be removed from any street or premises in the municipality.

The several complaints in the report book were read, and the Inspector reported that he had attended to all of them.

The Chairman recommended that complaint No. 5 be further looked into, especially as to the cause of the complaint being made, and that the names of complainants be entered in the book hereafter. Adopted.

The Chairman also drew the attention of the Board to the false and exaggerated accounts made through the Chatham papers, especially the *Planet*, of the sickness existing, that the reports so made were false, and injured very materially the business of the town.

The Inspector was instructed to call on the several medical men and obtain from them a statement of the number of persons sick during the last month, with the nature of the disease, and if recovered.

Strong expression was given to the fact that the Board of Health feel a great drawback to their proceedings by the Town Council not selecting a place for the reception of night soil, and it is felt that the said Council are open to public censure if they do not at next meeting attend to this matter.

Mr. Smith reported that he believed that all kinds of diseases were on the decrease, and the health of the town improving.

The Board have strongly urged upon all parties building water closets in connection with new buildings, and the owners of all water closets within the municipality, the necessity of adopting the dry earth system, as it is the intention of the Board to use their power to the utmost to have this system enforced before long, as the only safeguard against the pollution of wells, which is now known to cause much sickness.

It was ordered that 200 copies of the following notice be posted about the town:—"All persons are hereby requested to report to the undersigned any nuisance detrimental to the public health, that they may know to exist within this municipality."

The Board of Health would strongly urge all who wish to see the appearance of the town improved, and also improve the town as to healthfulness, to take down all fences that can be possibly dispensed with, thereby saving the accumulation peculiar to bottom of wooden fences and fence corners, and also to turn up and remove trees, wherever too much shade and consequent dampness to houses and streets are produced. Would also

suggest to housewives (instead of throwing them out) the burning in their stoves peelings and all other surplus matter peculiar to the kitchen; they also suggest that no pigs be kept after this year in the municipality.

Dresden Town.

CHAIRMAN'S REPORT.

Upon their organization the Board deemed it their first duty to make known to the public the principal and leading requirements of *The Public Health Act of 1884*. They therefore had printed and posted in public places in the town large posters setting forth the most important provisions of the Act.

They then directed a careful and systematic inspection to be made by the Sanitary Inspector of all lanes, yards, outbuildings, drains, etc., and a report to be made thereupon as to their sanitary condition, and in a great majority of cases the Board were pleased to find the report very favourable; yards, etc., had been properly cleaned and disinfected, and the occupants had displayed a praiseworthy willingness to assist the Board and their Inspector in their efforts towards sanitary reform.

In some few cases the Board found that it might be necessary to use the powers vested in them by the Act, but before doing so they instructed the Inspector to give due notice to the offending parties, which was done with most gratifying results, subsequent inspection showing that in every case the notices had been complied with.

The Board at all times felt the necessity of making their work as efficient and as inexpensive as possible, and your honourable body are aware that the amount expended has been small indeed.

The Health Inspector now reports that the sanitary condition of the town is good.

Before closing this report might I venture to call the attention of the Council to the following extract from the second annual report of the Provincial Board of Health:—"Throughout our Province, as in most other countries, more deaths are caused yearly by the want of systems for securing thorough cleanliness of streets, lanes, and premises, good ventilation, effective drainage, good water supply, etc., than have ever been superadded to the ordinary mortality by any epidemic of cholera that has occurred." It has been estimated that in this Province of Ontario alone 2,807 lives are annually lost through lack of proper sanitary precautions. It is unnecessary and probably would be out of place to urge the desirability from every moral, financial, and human standpoint, of remedying this state of things as far as in us lies. No doubt a very large proportion of these deaths occur in the large towns and cities, and our own town is comparatively free, but although our duties are light it does not become us, nor is it wise, to be negligent. Careful selection should be made of citizens to form the Local Board of Health; men should be chosen who are likely to be intelligent, conscientious, and persevering in the performance of the all-important duties they undertake; a neglect of which may affect not merely the welfare and health, but possibly the lives, of a number of their fellow citizens; and the citizens should remember that without their cheerful co-operation the usefulness of the Board will be very seriously curtailed.

J. W. SHARPE,
Chairman.

SANITARY INSPECTOR'S REPORT.

The undersigned Sanitary Inspector for the Town of Dresden begs to submit his annual report as follows:

A careful inspection has been made from time to time of all privies, yards, wells, lanes, etc., as required.

In most cases I found the premises clean and in a good sanitary condition—wells, yards, and privies properly clean and disinfected.

In a few cases I have had occasion to notify, and did notify, the occupants to have premises, etc., cleaned, and upon subsequent inspection I found that the notices had been complied with.

The general sanitary condition of the town at the present time is good.

NOAH WAFFLE,
Inspector.

WATERLOO.

Town of Galt.

SECRETARY'S REPORT.

In submitting to you the First Annual Report of this Board it is a matter of congratulation that so much work has been accomplished in the short time that your Board has been organized—viz., since the 10th of June last. At that meeting a Sanitary Inspector was appointed, Mr. James McFeggan, Chief Constable, also a Medical Health Officer, Dr. Brown. But it was not until the 23rd July, when it was found necessary to appoint an Assistant Inspector, Mr. Thos. Patterson, that any regular system was adopted. Mr. Patterson was then instructed by your Board to make a house to house visitation, and I think that your Board has been well satisfied in the way Mr. Patterson has done his work. Your Board ordered several barrels of copperas, which were sold to the inhabitants at a low rate, was freely used, and found very beneficial. During the first inspection of the town by the Ass't Sanitary Inspector he found a good part of it in a very bad state, especially in the central part of the town. After several inspections a decided improvement was noticed, not only by your Board, but by the inhabitants generally. After a few visits by the Inspector he found the ratepayers willing to carry out the orders given by him according to the requirements of *The Health Act.* In a great many parts of the town the Inspector found the water in many of the wells in a very impure state, especially in the town levels, some of them being so bad that they were ordered by your Board to be closed up, which was done. At the termination of the Inspector's duties he reported the town in a very satisfactory state of cleanliness. At the last meeting of the Council a report was presented from your Board urging upon them the necessity of passing a by-law for the introduction of the earth or ash closet system, and in connection therewith a thorough system of cleansing under the authority of the municipality. By this means the town will be in a much healthier state, and the water supply of a much more wholesome nature.

Should the Council acquiesce in passing the by-law, the duties of the Sanitary Inspector will be greatly relieved.

JOHN G. DYKES,
Secretary.

MEDICAL HEALTH OFFICER'S REPORT.

It is matter for congratulation that the Municipality of Galt, acting upon the recommendation of the Provincial Board of Health, has this year established a Local Board to look after the sanitary interests of our town. Although the summer was well advanced before the formation of the Board, yet, organization being accomplished, a vigorous policy was at once inaugurated.

The prevalence of cholera this year in Europe, with the possibility of its crossing the ocean and attacking our country, and even our town, as it did fifty years ago, added stimulus to the efforts of the Board. In the short space of time at their command much has been done in the way of sanitary reform.

The appointment of an Assistant Sanitary Inspector, arising as it did from the suggestion of the Inspector himself, was certainly a move in the right direction, and has

enabled a thorough inspection of the town to be accomplished, resulting, as might be expected, in the discovery and removal of many nuisances. Although a good deal of illness has prevailed during the last few months, yet it has not been so generally extended as in several former years; and this is no doubt partly owing to the salutary efforts displayed by the Board of Health.

Of the usual zymotic diseases, I may say that Measles, although it prevailed somewhat in the early part of the year, was generally light, uniformly resulting in recovery. Of scarlet fever, very few cases have occurred. These were chiefly of an isolated character, while none of them terminated fatally. With Diphtheria the result has been less fortunate, the cases somewhat more numerous, and although recovery was the rule, yet several patients succumbed, death following a brief and almost hopeless struggle. The first mentioned of these diseases seemed to be epidemic, but was of such a mild nature that very little medical treatment was sought for or required. The other two, being recognized by the people generally as being more formidable in their nature, were at once placed under medical treatment when they became apparent; and although their origin appeared to be *de novo*, and could not be traced, yet by carrying out the principles of isolation and disinfection the physicians usually succeeded in stamping out the diseases themselves and effectually preventing their propagation among the people.

In Galt, as in most other large towns, Typhoid Fever is generally endemic in the fall of the year. This season we have had a good many cases, though not nearly so large a number as was generally supposed, and within the limits of our town I believe only one case has proved fatal. The origin in nearly all the cases could be traced to impure water, defective drainage, or pernicious water closet arrangements; and as these are matters directly within the bounds of municipal legislation, I would earnestly recommend the Board of Health to press upon the Town Council the advisability of giving them their mature consideration.

I believe it is the intention of the Board to present an ash or earth closet scheme to the Municipal Council for their approval. I can only say that it is worthy of their highest approbation, and if properly established would be of very material benefit to the health and comfort of the community.

When we remember that Asiatic Cholera has prevailed with such terrible fatality in Italy and some parts of France during the recent summer and autumn, and that now again it is raging with all its virulence in the heart of Paris, as well as in other towns of France, it is manifest that the municipal government cannot be too careful of the health and interests of our people, for it is impossible to foreshadow what another summer may bring forth.

J. P. BROWN, M.D.,
Medical Health Officer.

VICTORIA COUNTY.

Lindsay.

SUMMARY OF REPORT OF LOCAL BOARD.

In compliance with recent legislation, the Sanitary Committee of the Council was dissolved and replaced by a "Local Board of Health," appointed by the Council, which body adopted the by-law referred to in article 69 of the recent Act, in addition to existing by-laws.

The Board has since its appointment in May, 1884, without in any way using unnecessary coercive measures, effected a marked improvement in the sanitary condition of the town. Directing particular attention to a general cleaning up; from house to house inspection of premises; the removal of and giving outlet to stagnant water, where practicable and within the means of a heavily taxed municipality; the regular and periodical removal of offensive accumulations, and deposit of the same in a place set apart for this purpose.

A Sanitary Inspector has been appointed to act under the orders of the Board of Health. He is not a medical man, but being a gentleman of good education and determination of character, has given satisfaction to the Board, and, so far as known, has performed his uninviting and at times disagreeable duties to the satisfaction of the public generally. The salary of this officer was fixed prior to the appointment of the Board of Health, but has not yet been altered to meet with the increased volume of his duties and responsibilities.

Excreta are generally taken away at night and deposited in a place set apart for its reception, but rendered as inoffensive as possible by being covered with earth.

The town of Lindsay, like other comparatively new towns, neglected the necessary precautions on determining and placing on record a regular plan for the level of streets and cellars. In many cases people when building were governed more by expediency and utilization of space than the subsequent sanitary condition of the town.

Privy pits were dug and wells sunk without due caution in regard to proximity. This evil is now being rapidly removed and will in a short time, under sanitary supervision, disappear.

No disease has been reported as attributable to this state of things. Water for drinking purposes is usually carried from wells better situated and unpolluted by deleterious matter. Wells are now periodically cleaned.

Early in the summer of this year, in some cases before the appointment of the Board of Health, and before the receipt of the explanatory instructions from the Provincial Board, a virulent type of Diphtheria made its appearance in the family of Mr. Sanderson. This gentleman occupied part of a large wooden tenement house centrally situated in the town. The first of his family attacked was a boy then suffering from a pistol shot wound in the neck. The sister of the child, who had been visiting at Peterborough, where Diphtheria was reported prevalent, nursed the wounded child, and soon after her return the disease appeared and in a few days three of the children died. On close inspection the Inspector found a cistern on the premises in a very offensive and filthy condition.

The Sanitary Inspector personally superintended the disinfection of the houses, using chloride of lime, carbolic acid, etc.

No system of isolation beyond putting up the notices, and prevention of children attending school was adopted.

Children were kept at home until permitted to attend school under permission given by medical attendants.

J. DEACON, Chairman.
JAMES W. KNOWLSON, Secretary.

MIDDLESEX.

London East.

CHAIRMAN'S REPORT.

I beg to submit to you the first report of the London East Board of Health, accompanying a report of the Medical Health Officer, which contains some important suggestions for the future health of our town.

Our Board consists of nine members, two of whom are medical gentlemen; one of them, Dr. Gardiner, has been appointed Medical Health Officer, without salary. We have also appointed the town constable Health Inspector without salary, who has visited a large number of the yards and wells. He reports a number of the wells as being in a very bad state, and has taken the water of the same to the Medical Health Officer for examination, who reports, after giving the water a thorough test, some totally unfit for use.

The sanitary measures for the benefit of the public health have not been so systematically carried out as they should have been, owing, in a great measure, to not being conversant with the Act made and provided.

The memorandum book for the Health Inspector has not been used this year, owing to his not being a paid officer; believing the finances of the town would not permit of the Board making a demand this year, they have tried to work without expense.

There has been more Typhoid and Malarial Fever this summer than last, and the Board would strongly recommend that a by-law be passed to provide for a better system of water-closets and the cleaning of the same; also, that the creek known as English Creek, should be cleaned out at least once a year, to give a free course for the drainage leading into it to pass away freely, as the neglect of cleaning causes the creek to overflow at certain seasons of the year and the overflow of water runs into the wells, carrying with it all kinds of filth, causing much fever.

The Board hopes to have next year a paid Health Inspector, who will make a thorough inspection, reporting all cases of note to the Board.

The Board also hopes that when London East has water works, either of their own or from the city of London, that a large number will avail themselves of pure water, as many now are drinking and using very impure water, causing a great deal of sickness.

Also the matter of draining must very soon have your special attention.

All of which is respectfully submitted.

CHARLES TILLEY,
Chairman.

MEDICAL HEALTH OFFICER'S REPORT.

I am sorry that this, the first Report of the London East Board of Health, is very incomplete. The reasons are these: First, your Health Officer has given me no data from which to frame your report. Second, the short time our Board has been in existence; and lastly, because my time has been occupied so much that I have been unable to collect the material for the report. With the foregoing explanation, and hoping that future reports may be more satisfactory, I submit the following to you:

The Town of London East is so situated that it ought to be one of the healthiest in the Province. The porous nature of the soil, the excellent facilities for drainage, and the inland and elevated position which it occupies, are factors in which nature has been lavish for our aid. I am happy to state that our death rate will compare favourably with that of any other town of the same size in the west.

But although I state these facts I have also to add that there is a good deal of sickness in our midst which might be avoided. Apart from the nature of the season, which has been one favourable to the development of Typhoid Fever, Diphtheria and kindred diseases, there have been too many cases of fever to trace them merely to accidental causes. Two well marked centres have existed for some time, and from these the disease has radiated to a considerable distance, but happily has not become at all general. I refer to the asylum creek, which drains the piggery and slaughter-house. Steps have been taken to check this nuisance, which I hope will prove to be successful; and a well on Van-street, the water of which has been very impure. I have also observed that quite a number of cases are found where the soil is low and damp. These are the chief apparent causes of disease, but others exist which at any time may prove to be much more serious causes of sickness. I will name a few of them, with the hope that when your next annual report is submitted they will not exist. The first and most serious are the cesspits which exist on almost every lot; the general habit is to dig one of these and use it as long as possible, cover it up when nearly full and dig another. As a result of this our soil will soon become so permeated with animal matter that the wells will be impure, and if Cholera or other allied disease visit us the result will be disastrous. A by-law is being prepared to remedy this evil in part. It will be your duty, gentlemen, to see that its provisions are carried out. The wells are another source of danger to us. In many parts of the town the water is good but in others it is not first-class, and in all many wells contain water unfit for use, either on account of their proximity to the water-closets or on account of not being cleaned. The wells as well as the closets ought to be inspected in a systematic manner by a person

competent to judge of their purity. Still another source of disease is the manner of construction of many of our houses; the foundation is of wood, they are built close to the ground and banked up early in the fall, and the earth is not removed in the spring; as a result, mould and dampness exist beneath the house, and the health of the inhabitants suffers. The foundations should either be stone or brick, and these should be ventilated, but if wood is used a free current of air should pass beneath the house during all seasons but winter.

The last source of disease to which I would refer is the dampness of parts of the town, especially the northern and north-eastern portions; the remedy for this is in deepening English Creek. I am happy to state that this has been commenced, but only partially completed, the cause for the delay being the lack of funds. I hope, gentlemen, you will consider it your duty another year to see to the completion of it.

These, gentlemen, are some of the causes of sickness in our midst, the most of them are easily remedied. It is your duty to see that they disappear, so that if plague or pest visit our town there will be no open door to invite its stay. Do not lock the door when the steed is stolen, but be prepared for the worst and hope for the best.

J. H. GARDINER,
Medical Health Inspector.

GREY.

Town of Meaford.

SECRETARY'S REPORT.

The Board of Health held its first meeting on the 9th June, 1884, when notices were ordered to be served on three different parties to remove nuisances reported by the Chief Constable to exist on their respective properties.

It was resolved to request the Town Council to appoint a Sanitary Inspector.

A second meeting was held on the 28th day of June, 1884, when notices were ordered to be served on thirteen different parties as to nuisances reported by the Sanitary Inspector to exist on their respective properties, requiring them to remove such nuisances.

A third meeting was held on the 21st July, 1884, when it was ordered that certain tenants should be charged with the expense of removing certain nuisances where the owners had failed to do so, and such tenants were directed to deduct the amount from rents due by them.

A fourth meeting was held on the 21st day of August, 1884. Questions from the Provincial Board of Health were submitted and answered, and the Sanitary Inspector was directed to have a drain made from the fish-houses so as to abate the nuisance existing there—which drain was made.

A fifth meeting was held on the 24th September, 1884. The Sanitary Inspector reported that a nuisance existed on a certain lot in the town, and the Secretary and Inspector were instructed to have the necessary notices served on the parties concerned, requiring the removal of the nuisance.

A sixth meeting was held on the 27th October, 1884, when the Sanitary Inspector was directed to have the nuisance, reported at the last meeting, removed at once, as neither the owner nor the occupier, although duly notified to do so, had removed the nuisance.

The Board is satisfied in being able to report that in every case brought before them the nuisance complained of has been removed or sufficiently abated.

The general sanitary condition of the town is tolerably good, and the Board confidently hope that in future every inhabitant of the town will attend to the sanitary condition of their premises and thus render the work of the Board less onerous than it has hitherto been.

The Board has not, as yet, appointed a Medical Health Officer, and as there have been but few, if any, cases of contagious or infectious diseases in the town during the year, it is not thought necessary to make the appointment. It is hoped that a strict attention by the Sanitary Inspector to the duties of his office will render such appointment unnecessary.

JOHN ALBERY,
Secretary.

WELLINGTON COUNTY.

Mount Forest Town.

SECRETARY'S REPORT.

There is a Local Board of Health in Mount Forest and it has a Sanitary Inspector, but no Medical Health Officer. The Council has set apart the sum of $25 for the use of the Board. The Inspector made a tour of the town and had all yards and premises cleaned up, but did not keep a detailed report of the amount of sanitary work performed. The town is in a fair sanitary state. In case of an epidemic of disease visiting us we have no isolation hospital, and if such is not erected would have to depend on the ordinary methods employed in such cases.

W. C. PERRY,
Secretary.

LENNOX AND ADDINGTON.

Napanee.

SECRETARY'S REPORT.

It is a source of congratulation on being able to report, that during the past year, and more especially since the appointment of the Board under the new Act, that the absence of infectious diseases and the comparative healthy condition of the municipality, there had not been a very great necessity for any active measures or special attention of the Board, further than the appointment of a Sanitary Inspector, until about the first of October Scarlet Fever broke out in the town which has prevailed to the present, 100 cases having been reported by medical practitioners, nearly all now being convalescent, and eight cases which were fatal. The epidemic appears now to be quite abated, as there is but one or two isolated cases reported. The Sanitary Officer under the supervision of the Board, during the early part of the season made a thorough inspection and examination of all streets, lanes and premises where offensive or dangerous accumulations, prejudicial to the general health of the inhabitants might exist, and caused the same to be removed, and the town placed in a thorough healthy condition.

In view of the fact of rumours of the existence of Small Pox in an adjoining county, the attention of the Board has been called to the necessity of taking prompt and active measures to prevent an outbreak of the epidemic in the town, and of procuring an isolated building to be used as an hospital, if required, in case of any dangerously infectious diseases breaking out in the municipality.

I am unable herewith to include the report of the Chairman of the Board as provided by Statute, as he has neglected to submit it.

P. EMBURY,
Secretary.

LINCOLN.

Town of Niagara.

SECRETARY'S REPORT.

I have to report that Scarlet Fever, Diphtheria and Typhoid have been in a few families, but did not spread to any alarming extent. Nuisances, such as privies, unsanitary slaughter houses, etc., have received the necessary attention, and some were dealt with in a forcible manner in accordance with the Act. The town is now in a comparatively good sanitary condition.

DAN SERVOS,
Secretary.

WELLAND.

Town of Niagara Falls.

SECRETARY'S REPORT.

On July 21st, the services of Sanitary Inspector Coulson were dispensed with, and William Hoey appointed in his place, and in default of William Hoey accepting the office, L. D. Groom was appointed Sanitary Inspector by the Chairman, and served as such during the warm weather, and was paid $35 for his services by the Town Council on the recommendation of the Board of Health.

The Board encouraged the use of disinfectants by furnishing copperas at cost price to citizens.

No Medical Health Officer has been appointed by the Board.

Whatever expenses the Board incurred were paid by the Town Council on the recommendation of Board.

The sanitary condition of municipality is good, and has been during 1884.

J. ROBINSON,
Secretary.

BRANT.

Paris Town.

CHAIRMAN AND SECRETARY'S REPORT.

We beg to report that the Board has held regular sessions when occasion required, and report that a thorough supervision of the whole town has been exercised, which the Sanitary Inspector's report herewith certified will show.

No difficulty has been put in the way of the action of the Board, and a ready response has been made, even when the matter complained of required the outlay of money to remedy.

The town has been comparatively free from Typhoid Fever and epidemics; a few cases of Scarlet Fever brought from Brantford were carefully looked after, and their spread stayed.

The well on Grand River Street has been ordered to be closed, many complaints having been made as to the water.

The Board recommended the payment of ten dollars to the Secretary, and the same sum to the Sanitary Inspector for services rendered.

CHARLES WHITLAW, Chairman.
S. DODSON, Secretary.

SANITARY INSPECTOR'S REPORT.

I made a formal inspection of every house in town during the month of May, and found the condition of the premises good, excepting the privies of twenty-one, which, as a rule, were full; left orders at the time for these to be cleaned or disinfected, as each case required.

On my second visit to see if my orders were carried out, I found that they had been, that either disinfectants had been sufficiently used or the privies covered up and new ones dug. Since I received more definite instructions from the Board, my orders are to clean out all privies before they are filled up; after this I went through the town to ascertain the number of pig-pens, and found that there were seventy-two in use. Complaints had been made against two of them, and an order for their removal was promptly complied with; all the other pens were kept in accordance with the by-law. Complaints were also made to me of a butcher's slaughter house, contrary to the by-law; this, too, was promptly attended to. Complaints have now and again been made about the refuse from the premises on the east side of Grand River-street being emptied into the river, and that during low water it accumulates and an unwholesome smell prevails. This has been partially remedied by digging an open drain in the rear of the buildings, and allowing a good stream of water to run through it. This can never be satisfactorily remedied until ash closets are constructed in the rear, and the contents carried away, thereby preventing the pollution of the river and the noxious odors.

I beg here to state that several of our townspeople have introduced the ash closet.

A complaint arising from a hen coop on Broadway-street was promptly remedied.

Complaints have frequently been made in reference to a stagnant pool in the south-east corner of what is known as the flats; it has been a resort of ducks and geese. The people of the neighbourhood have looked upon it as an unhealthy spot, and the source of foul emanations. The mayor promised to have it removed, and this source of complaint is expected soon to be a thing of the past. A stagnant pool near the station is occupying the attention of the Board, regarding how best to remove it altogether.

One or two lots which are flooded by a spring rendering them damp and boggy, I have advised to be attended to.

There are two dams in the town, one of which I believe no exception can be taken to, as it is occasionally pretty well emptied, and but little stagnant water exists at any time. The other one on Smith's creek is surrounded by considerable marshy ground, which is thought to have an evil influence.

The race on Smith's creek and the Grand River have at times been noticed to be much colored with dyes from the factories, to which the attention of the fishery inspector should be drawn.

The drainage during the last year of a piece of ground known as the Cricket Park, on the outskirts of the town has, no doubt, had its influence for good; previous to draining there was a large marsh. When the drain was fresh dug, the workmen complained of a very strong smell.

The water-works which are now being connected with many houses, supplying the purest spring water, is a manifold blessing to a large number of people.

GEORGE PIERCE,
Sanitary Inspector.

Peterboro'.

SECRETARY'S REPORT.

As required by *The Public Health Act, 1884*, I hereby submit the First Annual Report of the Peterboro' Board of Health, and while regretting that much sanitary work yet remains to be done, I think the Board may congratulate itself upon accomplishing

many things which will have a tendency to render the work less laborious in the years to come.

The Board was duly organized in May last, as required by law, Mr. Andrew McNeil being elected Chairman. The Town Council, upon receipt of the first report of the Board, appointed the following salaried officers:—Dr. John Clarke, Medical Health Officer; P. C. R. Pidgeon and P. C. R. H. Adams, Sanitary Inspectors; James G. Macdonald, Secretary.

Since its organization the Board has held seven formal meetings, besides numerous informal gatherings or conferences whenever anything special was brought to their attention.

We have had considerable difficulty in getting persons to make complaints and substantiate them, as we find out that people will stand even a great nuisance for a considerable length of time, rather than inform on their neighbours.

Another matter I may here mention is the fact of members not attending the meetings regularly. At first no difficulty was experienced in getting full meetings, but as the novelty wore off the members began to pay less attention, until on the two last occasions enough members to form a quorum were with difficulty "drummed up."

On the whole, I think I can say that the Act has been fairly carried out in this municipality. Our inspectors who are also police officers, building inspectors, etc., have not, perhaps, paid as much attention to their business as they might have, but press of business is the excuse to be urged. The suggestion has been made that next year one man be appointed whose sole business shall be that of Sanitary Inspector, and in all probability such will be done.

I have no doubt that some amendments to the Act will be made at the next Session of the Legislature, and I have drawn the attention of our member, Mr. John Carnegie, to several clauses which I think need amendment.

Some of the physicians have made reports of all the infectious diseases encountered by them, while others have not paid the slightest attention to the circulars and blanks furnished by me to each practitioner in town. I make this statement from a full knowledge of the facts, gained from a perusal of the death returns as registered in the office of the Town Clerk. The delinquents were each spoken to and promised to make the necessary reports in future. A fact that my attention has been drawn to, on more than one occasion, is that the higher a patient stands socially or the better he or she is endowed with this world's goods, the less likelihood there is of the attending physician ordering the house to be placarded, by sending in the necessary form.

Several very important matters, such as the filling in of Spaulding's Bay, sawdust in the river and lake, a system of sewerage, etc., have come before the Board during the year, but in no case has an entirely satisfactory solution of the difficulty been arrived at. Dr. Bryce personally inspected Spaulding's Bay and can speak as to the great cost and difficulty of filling up what is a veritable pest hole and hot bed of malaria. The cost of abating this nuisance has been estimated at from $20,000 to $30,000 by a competent engineer, figures that place the matter away beyond the reach of this Board or the Town Council, as for such a vast outlay, the town would only get a few acres of land in the outskirts.

The quantity of saw-dust in the river and lake is enormous, and the gases arising from the decomposition of it cannot be conducive to health. As I understand, there are other places situated the same as us in this respect, and that the Provincial Board intend to take some action in the matter. I would suggest that this is a matter that calls for the interference of the Government, as it is a matter beyond the control of the authorities of the town and county.

At first the complaints regarding slaughter-houses within the corporation were numerous, but rigorous measures and a close bi-weekly inspection has had such a good effect that all complaints have ceased, and the premises of all the butchers are now kept clean and orderly, and do not give even the slightest offence to those who reside closest to such places.

Our system of sewerage is very defective, but of late much attention has been drawn o the matter by the construction of water-works, and it is expected that during next year omething will be done to provide a proper system.

With regard to the water closets at the railway stations, plans of which were sent t$_o$

the Provincial Secretary, I have to say that the notices of the Board, regarding the adoption of the dry earth system, were totally ignored by both the Canada Pacific and Grand Trunk Railways and knowing from past experience that the companies, if beaten in the Police Court, would, if necessary carry the case to the Supreme Court, and as the closets at both depots are kept in a clean condition, legal proceedings were not taken.

By a resolution of the Board all the owners and occupants of premises in the centre of the town, within a specified area, were notified by the inspectors to fill up their vault water closets and substitute therefor closets on the dry earth system, but owing to the doubt existing as to the authority of the Board to enforce such an edict, those who failed to comply, embracing nearly all who were notified, were let severely alone.

One thing that militates against the introduction of the dry earth system is the cost of the closets. We have received circulars from a dozen different manufacturers, but the prices of all are "away up," and unless some person will go into the business and manufacture a cheap and good article, we are much afraid that the progress in this respect will not be very rapid.

When the inspectors first started on their rounds they had considerable difficulty in enforcing their instructions, but a number of fines imposed by the Police Magistrate, the cases being fully reported in all of the local papers, had a most salutary effect, and since then they have had no difficulty.

Early in the year the Board secured an excellent nuisance ground, an old sand-pit situated on the outskirts of the town. Trenches were dug ready for the reception of the deposits and the owner of the property is always on the premises ready to help to cover up anything that may be drawn there. It has worked well and all have shown a disposition to obey the law.

In conclusion I would refer you to the Medical Health Officer's report which follows, in which a detailed statement of the work done during the year is given.

A. McNEIL,
Chairman, B. H.
JAMES G. MACDONALD,
Secretary, Board of Health.

MEDICAL HEALTH OFFICER'S REPORT.

In presenting to you the Medical Health Officer's first annual report, a word or two may be said in reference to the purposes of these institutions which an Act of Parliament has rendered necessary in the municipalities of the Province.

The first, and I believe the greatest, object is to call attention to the vast importance of sanitary work, more particularly in crowded towns, in limiting the progress of disease, in removing these unhealthy conditions which are a standing invitation to outside epidemics, in not only giving the prospect of longer life to our citizens, but ensuring that they shall be healthier and happier and more fit to cope with the struggles of existence. Coupled with this is popular education in the means by which this perfect sanitary condition may be brought about. The second object is the enforcement by law of sanitary precautions and necessities where occasion demands it.

"An ounce of prevention is worth a pound of cure," should be the motto of every Board of Health. When sickness comes it is too late to act. The blow has been struck, and we can as soon expect to give life to a murdered man by punishing the assassin, as to cure the disease by putting an end to its cause. It is unquestionable that a large proportion of diseases is due to conditions arising from ignorance of the laws of life or carelessness of their effects. Consequently by proper attention to these conditions many diseases may be prevented, or, at the least, greatly ameliorated. As an instance of the value of sanitary work in lessening the tables of mortality we may take the ratio of deaths to population during the six years before the passage of the *English Health Act of* 1875 and the six years after that date. We find that during the first mentioned period the death rate was 22.09 per 1,000, and during the last mentioned 20.63 per 1,000, the total saving thus effected in six years amounting to 119,118 lives. A sceptic

might say that this was all chance. Science believes in no such thing as chance. Science believes that everything happens as the result of an inexorable law, that every atom of dust that blows about the streets is deposited in its place, that every drop of rain is urged to its destination by the resistless force of that law. Precisely the same thing occurs as regards the elements of disease. Not a germ of disease floats through our air but was generated by exact conditions and will reproduce its kind when it lodges in the proper soil, as surely as wheat produces wheat, or an acorn the oak. It is time, therefore, that we should get rid of the idea that disease comes by the visitation of God, that is to say, that it is unpreventable and should be submitted to with the fatalism of a Hindoo. Sometime ago a serious epidemic visited Scotland, and the people asked Lord Palmerston, the then Prime Minister, to appoint a day of humiliation and prayer for the aversion of the plague. He answered that as soon as the people had cleaned up the filth about their streets and dwelling-houses he would have no objection to accede to their request, but that before such measures had been taken, it would only be an insult to the Almighty to ask Him to remove what had been caused by negligence and could be checked by their own exertions. The rule is applicable everywhere. Strict cleanliness is the great precautionary measure. And this cleanliness must be general, thorough and constant. A town which, otherwise a model of sanitary perfection, presents a single nuisance, is similar to a splendidly fenced field of grain with one little gate open. Epidemics are sometimes a blessing in disguise by arousing popular attention to sanitary errors. It would, however, be criminal to wait for epidemics. Let us be constantly alive to our necessities. Eternal vigilance is the price of health as well as of liberty.

During the first few months the Board has been in operation much has been done. Although late in starting, a good commencement has been made. To be sure, we have not done all we could have wished. Our hands have been tied by various causes. Some questions have arisen as to the correct interpretation of the law. Being a new thing, it was natural too that many should object to the stringency of some clauses. But I think I am justified in saying that upon the whole the law has worked well, and that there is a general feeling among the public that even those regulations that are least palatable should be carried out, not, perhaps, with the utmost rigour, but with a temperate firmness which is certain to attain the desired end.

The particular questions that claim the attention of the Board are—

Slaughter-houses.—From a sanitary point of view, when a town reaches the dimensions of Peterborough all slaughter-houses should be removed outside. From the very necessities of the case they must gather about them more or less deleterious matter, even though the utmost caution be exercised. Careful inspection has been made once or twice a week during the season, and the butchers themselves acknowledge the benefit of a stricter attention to cleanliness. I believe they have done their best to meet the views of the Board. Some of the places being old and more saturated with soakage have necessitated the use of large quantities of disinfectants. The very trouble required in keeping them passably clean is an evidence of the difficulties in the way.

Sewerage.—The necessity for better sewerage was urged in a former report, and need not be referred to, except to emphasize what was then said. I have talked over the matter with most of the medical men here, and they unanimously consider it one of the most pressing needs of the town. Private individuals and large property owners take the same view.

Closely connected with this is the question of the disposal of excreta, and earth closets. At a former meeting of this Board a resolution was passed insisting upon the substitution of dry earth closets for privy vaults in the central parts of the town. Although a good deal of interest has been awakened by the subject, few have complied with the resolution. The season is late, and we are not sure yet that the most convenient and economical form of dry earth closet has been put in the market. I stated before that a good kind was being manufactured in town. Further improvements have been made in it to meet more extensive requirements. A stock company has also commenced the manufacture in Toronto of an earth closet largely used in England, and known as Heap's earth closet. Others are at work, and next season we bid fair to have the subject forced upon us by the solicitations of sellers, as well as by the decrees of the Board. An

important point is the supply of dry earth, for it is precisely where it is most needed that it is hardest to be procured. We have urged the matter upon the attention of gardeners and others. A lucrative business might be done in supplying dry earth for closets and removing excreta for purposes of fertilization. When we consider that from a town of 8,500 or 9,000 inhabitants, upwards of 200 tons of solid excreta might annually be obtained under a good system, we may judge of the fertilizing power that is lost. With the dry earth system all this might be removed in broad daylight without the slightest offence. When these facts are known more generally there will be no obstruction to the working of the dry earth system.

Removal of Garbage.—This is another important question. Scavenger carts ought to be more common in our town. Hotels and private families have a large amount of table and kitchen refuse difficult to dispose of. Pigs are prohibited, and in consequence everything is thrown into the back yards, or too often into the privy. In the investigation of nuisances we have found this to be a common cause of complaint among neighbours.

Wells.—Since last report I have analyzed the water from several more wells, and found considerable organic matter in most of them. The purity of water can not always be judged of by its appearance. As stated in the first annual report of the Provincial Board of Health, "well water may be bright, cool and sparkling, and yet highly dangerous, from the presence of the products of decomposing nitrogenous matter, and frequently from the presence of specific germs that may have filtered from neighbouring privies. Under the microscope water containing sewage discloses the presence of *bacteria* and *infusoria*, the frequent causes of bowel complaints, typhoid and other diseases. The notion that by filtering through the earth water is rendered pure is an erroneous one." Considering the vast amount of excreta with which the earth is saturated it is a wonder that diseases from impurities of water are not more common. At the same time we are always running a risk, the only remedy for which is to obtain our drinking water from a pure source, outside of the town.

Infectious Diseases.—It is a matter for congratulation that no serious epidemic has visited the town this season. The most noticeable feature under this head has been the occurrence of a number of cases of typhoid fever, a fact of melancholy interest to the Board of Health, as thereby we lost one of our most faithful members. Fortunately this disease, owing to the more rational treatment of the present day, has a favourable termination in the majority of cases, but its presence in any form is an indication of sanitary error. The reported cases have been subject to strict investigation, and are believed to be due not so much to general causes as to some local neglect. Typhoid Fever is one of those diseases which ought to be completely prevented by the adoption of enlightened principles.

A few cases of Scarlet Fever and Diphtheria have also occurred. When reported, complete seclusion has been insisted upon. Disinfectants, and the various other means of limiting the diseases, have been used. Reported cases have also been placarded.

Respecting the reports of medical men in infectious diseases, this part of the Act has not been as satisfactorily carried out as I could wish. Some of the leading practitioners have sent in reports faithfully, and have been active in giving assistance in furthering the regulations of the statute, but quite a number of cases are not heard of except by accident. These oversights will become less frequent as the advantages of the law are more fully recognized.

A few other matters claim our notice. The Spaulding's Bay question has been discussed, *ad nauseam*. No medical expert is needed to prove it a nuisance of the first order. It is sincerely to be hoped that some means will be found by which this town nuisance may be abolished, and thereby an example set to minor offenders.

The closing or reconstruction of the Hunter-street drain seems to have been relegated to the limbo of too expensive luxuries. In the exact centre of the town, it smells to heaven, as if a Presidential candidate was buried there. In default of more thorough work a great change might be made by simply cleaning out the shaft and putting a few pounds of disinfectant at the bottom.

The condition of the streets demands our notice also. I think they should be scraped oftener, particularly in the latter part of summer and fall. There is too much mud. Let

us think for a moment of the composition of this mud. The sweepings of the stores, scraps of fruit, manure, dirt of all kinds, festering together in an unsavory mass. When dry weather and high winds come all this is blown in the form of dust about the streets, to be inhaled by everybody, the prolific cause of Catarrhs, Bronchitis, Fevers, Diarrhœa, and it is hard to say what else.

The sawdust nuisance is another point of importance, but being of general interest is dealt with more fully in the answer to a series of questions issued by the Provincial Board. What we should think of is the fact that half a dozen mills are discharging constantly into the river an amount of sawdust equal to about ten per cent. of the output of lumber, that a large portion of this is carried into the Little Lake, that there it is mixed with sewage and other refuse from the town and surrounding shores, and that thus there is danger of the lake being converted ultimately, in part or in whole, from a beautiful sheet of water, admirably adapted for purposes of recreation, into a vast malarious marsh in comparison with which Spaulding's Bay would seem a rose-bed. Certainly this subject should receive the most careful consideration, and comprehensive measures be taken with as little delay as possible.

In compliance with a request from the Secretary of the Provincial Board of Health, monthly reports of disease, instead of weekly, as formerly, have been sent up. These, I believe, will give as fair an idea as possible of the ratio and prevalence of disease in the municipality.

I may say here that I have received scores of complaints as to nuisances of all kinds, alleged or real, from private individuals who did not wish their names mentioned or the matter brought before the Board. With the assistance of the Inspectors, I have endeavoured to have these affairs rectified as satisfactorily as possible. But it should be remembered by the public that the laws of the Board of Health are similar to any other laws, and that complete satisfaction can only be obtained by open and undisguised complaint.

To conclude, as I stated in the beginning, education is of paramount importance. How should this be obtained? The time is coming when we shall have it taught in our schools, but that is not yet. Our newspapers do noble work in giving the public selections from the best medical and sanitary publications. The Provincial Board of Health distributes pamphlets as far as its means allow, but those means are limited. To help along the good work I propose next spring and summer to write a series of letters to the papers on various sanitary subjects, giving practical hints as to those questions which lie nearest us and concern every individual. It is my desire, and I am sure it is the desire of every member of this Board, that the town of Peterborough, so conspicuous among other towns by its beauty and situation, by the enterprise and prosperity of its citizens, may be noted still more for that perfection of sanitary arrangement, without which all natural gifts and all acquired advantages would be in vain.

Respectfully submitted,

J. CLARKE, M.D.,
Medical Health Officer.

Synopsis of sanitary work done in the Town of Peterborough from 1st June to 15th November, 1884:—

Number of yards examined	456
Number of water closets	387
Number of yards found in good condition	95
Number of yards cleaned	342
Number of manure heaps, hog pens, etc., removed	130
Number of notices served, dirty yards and closets	183
Number of notices served, garbage and refuse	53
Number of notices served to put in earth closets	16
Number of old wells closed	4
Number of analyses of well water	17

Reports of disease :—

Smallpox	0
Scarlet fever	8
Diphtheria	7
Typhoid fever	12
Houses placarded	5

LAMBTON.

Petrolia Town.

CHAIRMAN AND SECRETARY'S REPORT.

The Board beg to report as follows :—

That the Board was organized on the 19th day of May last, under the Act of 1884, and that John Fraser, Esq., was appointed Chairman of the Board.

The Chairman was authorized to instruct the Sanitary Inspector, David Deacon, appointed by the Council, to proceed and make a thorough examination of the town, and that he should report daily to the Chairman the progress made.

That the Inspector entered upon his duty with zeal and firmness, and reported to the Chairman that the people, as a rule, obeyed his orders, and the town was soon put in good sanitary condition as far as circumstances would permit.

The Board procured a supply of blank forms for the use of medical men, to report on any outbreak of infectious disease in the town; that to the present time they have not had a single case reported to them, and believe the town to be at present in a good sanitary condition.

The Board are of the opinion that the public sewers of the town are good of their kind, and are being improved by inserting gas traps; they regret there is not a sufficient supply of water to flush the sewers.

The present system of privy vaults or pits received the attention of the Board, but the nuisance could not be remedied this season. The town being a new one, the Board felt that rules and systems applicable to older places could not at present be enforced here, but that important matter will likely receive attention early during the ensuing year.

JOHN FRASER, Chairman.
GEO. S. McPHERSON, Secretary.

ALGOMA.

Port Arthur.

MEDICAL HEALTH OFFICER'S REPORT.

The attention of the Local Board of Health was directed on its formation to the location of ground for the depositing of refuse, etc., the clearing of all ditches, cesspools, and other malarial spots, and a system of removal of garbage and refuse. The Board appointed a Medical Health Officer in the person of Dr. Jackson, and a Sanitary Inspector. The contents of privies requiring removal are carted away during the night and deposited in the "nuisance ground," and covered with a layer of earth. The inhabitants are looking forward to the introduction of the dry earth closet system, which is being vigorously agitated at present. The cleaning of wells has received attention, and where they are too closely situated to back premises, are closed. The principal source of water supply, however, at present, is a creek from which, at a point 1,200 feet up stream from the town, the water is taken. There have been thirty cases of Typhoid Fever during the year, and the drinking of impure water from forbidden sources we believe to be the cause. A

temporary hospital has been erected where those suffering from contagious diseases are sent to, and the houses wherein they contracted the disease well fumigated, etc. The Medical Officer visits the school once a week; and the Board have issued sanitary instructions under the Act, which, if attended to, will have the effect of reducing the sickness of the town.

H. P. JACKSON, M.D., Medical Health Officer.
A. W. LANGWORTHY, Secretary.

LEEDS AND GRENVILLE.

Prescott Town.

MEDICAL HEALTH OFFICER'S REPORT.

I have the honour, in reply to your circular of October 21st, of presenting the First Annual Report of the Local Board of Health of Prescott. Our Board, though only organized some months, and consequently in a somewhat primitive state, still has done some work in the right direction, and promises to, at least, partially fulfil the objects in view.

G. B. HART, M.D.

LAMBTON.

Town of Sarnia.

SECRETARY'S REPORT.

There is a Local Board of Health in this town, and the health of the inhabitants has engaged its attention since organization. There is a Medical Health Officer, but no Sanitary Inspector appointed. All complaints *re* unsanitary condition of privies, etc., have met with prompt attention from the Board and its Health Officer.

We have had three cases of Typhoid, three of Diphtheria, and three of Scarlet Fever, and all the powers given by the Act regarding isolation, etc., have been enforced. The Board strongly believes that "prevention is better than cure," and will do all it can to that end, and what is required generally by the Act of 1884.

E. H. JOHNSTON,
Secretary.

HURON COUNTY.

Seaforth.

SANITARY INSPECTOR'S REPORT.

I made a general inspection in June last of premises in this municipality, and beg to report as follows:

I found in many of the back yards manure heaps and other decaying matter which I instructed owners to remove, which they have generally done.

The privies were in a very unsanitary condition, and nothing could be done with them during the hot weather further than to have them regularly disinfected, which was generally done. I would recommend that the water closets be cleaned sometime during the winter season and the soil removed from town to some isolated place or farm, where it may be used as manure.

I found that there were ninety-three pig sties, varying from twenty to seventy feet from any dwelling house, some of which, nearest to dwellings, have been removed, and more will be disposed of as soon as owners can do so without loss.

E. LUSBY,
Sanitary Inspector.

CHAIRMAN AND MEDICAL HEALTH OFFICER'S REPORT.

The Council of Seaforth.

GENTLEMEN,—I am happy to congratulate you on the formation of a Local Board of Health under the co-operation and with the desire of the Provincial Board.

I have no doubt but you will agree with me when I state that there is already a marked sanitary improvement in the town. But you must remember, while we exchange congratulations in respect to our present healthy condition, we must bear in mind that we have been blessed with a summer that was remarkable for its coolness and salubrity. This notable feature being the case, it should stimulate us more and more to push forward the good work already progressing.

You will notice in reading the Secretary's report that the Board asks your assistance in the appointment of a scavenger for the town, whose duty will be guided by the Sanitary Inspector.

The Board also reminds you of its financial standing, and calls upon your kind generosity to appropriate such sum of money as you in your wisdom may see fit, to meet the current expenses of the year.

Hoping that the next annual report will be as favourable.

W. HANOVER, M.D.,
Chairman and Medical Health Officer.

LANARK.

Smith's Falls.

CHAIRMAN AND SECRETARY'S REPORT.

On the 4th day of August last the Municipal Council, by by-law, appointed a Local Board of Health, composed of W. H. Frost (Mayor), W. M. Keith (Clerk), and J. M. Clark, Wm. Graham and John Splane, with Dr. McCallum, Medical Health Officer, and Robert Reynolds, Inspector.

After our organization, as Diphtheria was doing its deadly work among the children, we determined upon enforcing a vigorous and thorough cleaning up. This place has always in the past borne a good reputation for cleanliness, but we found that the cesspools particularly, were, in a general way, in bad condition. These are chiefly constructed by excavating a hole in the rock and building up with stone. The Inspector reported against scores of them, and in every case the parties using them had to clean them out, and disinfect, and leave in a satisfactory sanitary condition. Some few refused to do anything, and in these cases the Board put on men and did the work, and made the unwilling parties pay the bill. This work was all done during the night, so that the citizens generally hardly realized what was going on. Every yard was also made scrupulously clean.

Some fears being expressed that our well water might be contaminated, we sent samples from four of the principal wells to Prof. Ellis for analysis. Three samples were pronounced excellent and one unfit to drink. The one condemned we found polluted by surface water getting in, and in it was a plentiful deposit of washings from the street. We caused it to be thoroughly cleaned, and provided—by removing a telegraph pole, which was the chief trouble, and other precautions—against any more surface water getting in.

Some of the butchers, in spite of many warnings, persisted in dumping the offal from their shambles into the river, where it often proved very offensive, especially when the water was drawn off for navigation purposes, and we resolved to have all slaughter-houses removed beyond the corporation. Owners have been notified to have them removed before the 1st of May next.

There has been very little Diphtheria during the last two months, and that only of a very mild character. As soon as a case is reported by the attending Physician the house is strictly quarantined, and supplies taken to the door by the Inspector.

The foregoing is a slight outline of the duties performed by us.

W. H. FROST, Chairman.
WM. M. KEITH, Secretary.

MEDICAL HEALTH OFFICER'S REPORT.

In presenting my annual report for the current year, allow me to compliment the Board on the increased and increasing interest taken in sanitary matters in our town since your appointment a few months ago. To train up this interest until it ripens into a sound, healthy public opinion on local sanitary affairs should be the especial care of the Board. As the time since your appointment has been so short there will probably never again be as many evils to combat, nor so wide a field for suggestions as to the course to be pursued in doing so. Inasmuch as there is a strong probability that this continent will be visited during the coming summer by that most dreadful disease, Asiatic Cholera, it behooves us to put the town in as good a sanitary position as possible, in order to minimize the danger. Should we be so fortunate as to escape this threatened evil, let me here point out that the work of preparing for it will not be thrown away, since all respectable medical authorities are of the opinion that Diphtheria and kindred zymotic diseases, if not caused by filth, mainly flourish where the surroundings are bad. With this object then in view, allow me to throw out the following suggestions:—

1st. That the Board use their influence with the Town Council to carefully amend the Model Sanitary By-Law adopted, so as to make it suitable to the requirements of our town, and having done this, rigidly enforce it. I need not suggest amendments, for they are quite obvious to any careful reader.

2nd. Too much care cannot be taken in properly securing the tops of all public wells against contamination by surface water or soakage. Dr. Ellis' report, I think, proves that the water in our wells when not so polluted is, though very hard, a first-class drinking-water. This matter of the purity of our drinking-water is the more important, since recent writers on the subject consider that Cholera is chiefly spread by the use of impure water.

3rd. Owing to the shallow nature of the soil in many parts of the town, the time is not far distant when we will be in a manner compelled to adopt some system of frequent removal of animal excreta and refuse vegetable matter. At the present time the dry earth system would seem the best adapted to the needs of the town.

4th. Either there should be a vigorous effort made to prevent the pollution of the river, or else, restriction on the use of ice and water therefrom, it being a notorious fact that the ice, cut to supply the town, is taken from the parts of the river near the town, where the ice forms the thickest; that is, where the current is the slowest, and hence, most likely to be polluted.

5th. Various theories having been advanced as to the cause of the prevalence of Diphtheria here during the last year, it may be expected that I will here express an opinion thereon. Previous to the outbreak of this disease our town deservedly had the reputation of being one of the healthiest places in the Dominion, and while our sanitary condition may not have been all that we could have desired, there was no apparent reason why the disease should have obtained so great a foothold had proper care been taken to thoroughly isolate the first cases that occurred. Unfortunately for numerous families and for the business interest of the town, no attempt was made to isolate the first two or three families where the disease broke out; hence we had the germs or poison of diphtheria disseminated over a large part of the town. Now it is fully authenticated among medical authorities that this poison retains its vitality for a long time, probably many months if not years; and this being the case a fresh outbreak will occur whenever some unfortunate child is brought in contact with some of this virus. At present we are free from the disease, and let us hope that the method we have pursued, of promptly isolating afflicted families, together with free use of disinfectants, will soon have destroyed every particle of the poison.

6th. Before concluding my report I wish to call your attention to another threatening danger of an alarming nature. I allude to the prevalence of Small-pox in a neighbouring county, connected with this by line of railway. You are aware that a few cases of this disease occurring here would effectually ruin the trade of the town for a long time. How many children and adults are there here who are unprotected by vaccination? I venture to say hundreds, and in this connection I would suggest that the Board procure

a supply of vaccine, pure and fresh from the cow, and pay a qualified physician such a sum as may be agreed on, to vaccinate all requiring its protection. In conclusion, I consider the Board has done a fair share of good work during the brief period of its existence, and trust their successors, whoever they may be, will pursue a similar enlightened course.

J. S. McCALLUM, M.D.

PERTH.

St. Marys Town.

In presenting this our first annual report to your honorable body we would congratulate you on the success of your efforts in establishing a Board of Health for the Province of Ontario.

There is no doubt that if carried on in the same spirit it has been heretofore, it will be a great boon to the people.

In starting out on our labours we found considerable dissatisfaction by some persons, thinking, no doubt, we were making ourselves too familiar with the state of their premises; however, that soon died away and we found no opposition offered us.

Throughout the town the general state of the premises with few exceptions was very good, and those complained of were remedied as soon as notified.

The question that will have to be grappled with eventually, will be a proper system of drainage for the town, whereby excreta, slops and other household refuse can be carried away or disposed of by other means.

Our water supply is excellent, having many flowing wells in the town; though if a proper system of waterworks were introduced would be much better.

We would recommend the closing up of the graveyards at the east end of the town, so far as interments are concerned, as they are being rapidly filled up.

No case of contagious or infectious disease has appeared amongst us, as we have no swamp or drowned land or stagnant water within the municipality, but on the other hand we are high and dry, with plenty of limestone around us and every sign of prosperity.

H. FRED SHARP, Chairman.
W. WILLIAMS, Secretary

Town of Stratford

CHAIRMAN'S REPORT.

As early in the spring as possible, notice was given calling upon the citizens to make a general cleaning up of their premises. Your Board has great pleasure in stating that the result was satisfactory.

Your Board carried out a regular system of sewer flushing throughout the warm weather.

Your Board is happy to state that during the year very little sickness has prevailed, and none of an infectious or contagious character. The death rate has been very low, only sixty-six, as shewn by the cemetery registers.

ISAAC RIGG,
Chairman.

MIDDLESEX.

Town of Strathroy.

The Secretary of the Board, in compliance with the requirements of the Public Health Act of 1884, begs to report as follows:

That the Municipal Council of the Town of Strathroy manifested a ready acquiescence with the several enactments of the Public Health Act, by the appointment at the May

meeting of three members, Messrs. F. A. Frank, W. B. Walker and John Iver, who, with the Mayor and Town Clerk, the *ex-officio* Secretary, composed the Board of Health for the town.

The Municipal Council, further to comply with the new state of things, and believing in the necessity of some legislative action towards the public health, passed the by-law furnished by the Public Health Act; and although not actually repealing the existing town by-law, which had been prepared with some care, enacted a clause providing that in all cases where there seemed to be a conflict between them, the Public Health Act was to rule and take precedence of the Town By-law.

The Board has appointed and held regular meetings on the last Friday preceding the first Monday in each month, with a view to bring before the Council any monetary matters requiring attention at the regular meetings of Council on the first Monday of the month, and the Board has no difficulty in the way of expenditure, which has always been satisfactorily met by the Council.

The Inspector, who has been zealous and active in the discharge of his arduous duties, has made a personal house to house inspection of the premises throughout the town, and has recommended the thorough cleansing of water-closets and premises generally, and has succeeded fairly well in accomplishing thus much. Next year it is intended to give attention to the wells, the water in all of which in this town is situated near the surface, and rises through a quicksand which prevails all over the town.

The site of this town is a dry sand with an ample supply of water for all domestic purposes, during the dryest of seasons, at the distance of eight or ten feet from the surface; and upon the whole the town is considered very healthy.

The Board caused to be printed for circulation some of the most striking and important clauses of the new Act to aid the Inspector in his duty, which had a good effect. Also the requisite slips were sent to the several physicians of the town whereon to report the existence of contagious and infectious diseases, and the Board is glad to report that no return has been made.

It is true there have been some few cases of malarial fever in the town, but none of a character so far as this Board knows, requiring to be reported by the town physicians.

The question of public health is one that commands our best attention, and it is vain to expect the public to comply closely with the elaborate provisions of the Public Health Act all at once; it is satisfactory, however, to know that a good deal has been done in that direction, and in order to insure success, the Board feels it must have the cheerful and ready compliance of the people themselves with all its requirements.

J. B. WINLOW,
Secretary.

HASTINGS.

Town of Trenton.

CHAIRMAN'S REPORT.

The town is built on both sides of the River Trent near its mouth, partly on the ancient river bed and partly on a high table-land which rises by one step on the east side and by three—in one place four—natural terraces on the west side, attaining at the highest point to an elevation of 190 ft. above the bed of the river. The soil in the higher portion is composed of limestone, gravel and sand, and in the lower of alluvium, overlaid near the base of the terraces with free lime, decomposed shells, etc., and covered by human or decayed vegetable matter to a depth of from a few inches to more than a foot, the whole resting on a bed of shaley limestone. From the base and sides of the terraces numerous springs of water issue which interlock on the level lowland, where the most thickly inhabited portion of the town is built. The houses, here for the most part without cellars, are erected over the wet soil, and owing to the damp floors are unwholesome and even dangerous, on which account cleanliness and drainage are of the utmost importance.

Into this thin, often semifluid, soil have been annually poured the sewage of kitchen, stable, sty and privy, in some parts for a period of forty years, which it has been compelled to take up by absorption or mixture, and thus add to the already unsanitary condition enormous quantities of organic poison. As might have been expected, diseases of miasmatic origin prevail for many months of the year. That matters are not much worse is due to the drinking-water which is supplied from the first terrace by gravitation through wooden pipes and is of excellent quality, except for an excess of the salts of calcium, but owing to the absence of effective drainage the overflow from the tanks is left to percolate through the soil at will and thus contribute to the dirt, dampness and discomfort of the streets, lanes and yards.

On the east side of the mouth of the river immense quantities of saw-dust have been deposited in shallow water, and during the heat of summer fermentation and other gases are exhaled, sometimes with audible explosions, and mingled with the air, is breathed by those living in surrounding higher localities ; and from this cause, as well as the too great proximity in such porous soil of the well, stable and privy, the dwellers on the hill also are sometimes affected with miasmatic diseases.

The principal manufacturer of lumber has, however, with commendable enterprise erected an immense furnace where all the saw-dust and waste are consumed as soon as produced, so that in course of time the soil will vanish.

The principal efforts of the Board were directed against the unclean stables, sties and privies, and while many entered heartily into the work of cleansing foul premises, others regarded the intrusion of the officers as an uncalled-for interference with their liberties, and were with difficulty prevailed upon to undertake the removal of unsavory accumulations of filth. The Board treated these with perhaps too much forbearance, hoping that reflection would convince them of the absolute necessity of every citizen seeing to it that his negligence shall not stand in the way of his own or his neighbour's comfort or safety.

In the case of drainage of stagnant water by permanent drains all except one complied with the mandate of the Board, and, in the absence of an epidemic traceable to this cause, they are not satisfied that the Board has a legal right to enter upon private property and carry out the work.

The Health Inspector made a house to house visitation during the season and reported as follows :

Number of pig-sties too near dwellings	140
Number of privies requiring cleaning or removal	70
Number of filthy yards	30

We have to report that this indefatigable officer continued to revisit these premises, till he is now able to report all in a fairly good sanitary condition.

The Chairman has to record his satisfaction that the members of the Board responded promptly to his calls, and took an active interest in the progress of the work.

CHARLES McLELLAN, M.D.,
Chairman.

BRUCE.

Town of Walkerton.

In reply to your circular of the 21st October last, I have the honour to report as follows :

The Board had posters printed and posted around calling upon all parties to observe the new by-laws in regard to health and nuisances, and warned the public that after 1st July the provisions of the Public Health Act would be strictly enforced.

On 27th May the Mayor, Clerk, and Messrs. Smith and Hume inspected the back premises, etc., of central part of the town and took notes of all that they thought was required, and in the evening the Board held a meeting when it was resolved : That 200 notification circulars be printed, and parties in default be served with written notice to remedy and abate each special nuisance.

Notices were served upon defaulters to the number of twenty-nine by the Inspector, and he afterwards reported that the nuisances had been abated.

At this meeting it was resolved: That the Council be requested to describe exactly what kind of closets should be permitted in town, and to pass a by-law to that effect.

This has never been done. A resolution was also passed at this meeting requesting the Council to order the cleaning up of certain back lanes in a dirty condition, and to have a certain drain deepened and cleaned out. This was attended to.

The foregoing is about the extent of the work done by the Board.

The Medical Health Officer has not reported, and it is intended to appoint a new Medical Health Officer at the next meeting of the Council this week.

The Inspector has performed such duties as the Board decided.

The Board has held four meetings.

JOHN CHAMBERS,
Secretary.

WATERLOO COUNTY.

Waterloo Town.

SECRETARY'S REPORT.

A Local Board of Health was duly organized in this town, and a Medical Health Officer was appointed but without salary. The general sanitary condition of Waterloo has received attention from the Board. With the exception of a few cases of Typhoid Fever, two of which proved fatal, there have been no other diseases of a serious character reported.

I believe that by systematic preventative precautions being taken very little, if any, contagious or infectious disease could possibly gain an entrance amongst us, and to this end it is the duty of the Board to act according to the provisions of *The Health Act*. There are no slaughter-houses within the municipality.

T. COLQUHOUN,
Secretary.

HURON.

Town of Wingham.

CHAIRMAN AND SECRETARY'S REPORT.

According to *The Public Health Act, 1884*, the Council of the Corporation of the Town of Wingham, at a regular meeting on the 7th day of May last, appointed by by-law a Local Board of Health consisting of five members.

Previous to appointment of the Local Board of Health the Municipal Council appointed a chief constable, part of whose duty it was to act as Health Inspector, which officer has acted as the Sanitary Inspector of the Board since its organization.

The principal work of the Board for the present year was rather to ascertain the sanitary or unsanitary condition of the town, than to make sanitary improvements, except where such cases were found, the condition of which demanded immediate attention.

To obtain this information, the Chairman of the Board together with the Inspector made a tour of the town, inspecting particularly those places the outward appearance of which as well as information they had obtained, led them to believe were not in a very cleanly or healthy condition.

The principal sources of uncleanliness were found to exist in the backyards of the business centre of the town, where the refuse from the houses was deposited or allowed to accumulate. Some water closets and pig pens were also found in a filthy state, and in

one case offensive and unsanitary business carried on in connection with a butcher shop. As a result of this inspection the offensiveness of the latter place was removed, and it became perfectly clean, and the conditions of many of the water closets and pig pens were much improved.

This town has yet no by-laws regulating water closets, consequently they are of various structure; in some cases the dry earth or ash closet is in use, but in most cases they are made of a small house erected over a pit which receives the excreta; these pits vary in depth from two to four feet; when these pits become full or too offensive the excreta is disposed of by being removed and buried in the ground.

As I have before mentioned it has been the duty of the Board this year to see that accumulated refuse is removed, and these offensive backyards kept clean, and in most cases in this respect the Board has been successful.

As this has been the first year our town has had a regularly organized Health Committee, we did not deem it prudent to adopt any very radical or extreme measures in sanitary improvements; but we expect that the Board next year will make more important sanitary improvements in our town, until it reaches a satisfactory condition in this respect.

Part of the town is supplied with a sewer, but the system is not yet extensive enough to be of much benefit to the community at large. This matter, however, we expect will engage the attention of the Board at a very early date, and a perfect system of sewerage will, no doubt, as soon as possible be constructed.

I may also add that our town, situated as it is on a beautiful spot on the bank of the River Maitland, in a very healthy part of the country, does not require as much labour to make it a clean and healthy place as other towns not so favourably situated in this respect.

WALTER SCOTT, Chairman.
J. B. FERGUSON, Secretary.

ESSEX.

Windsor.

MEDICAL HEALTH OFFICER'S REPORT.

In compliance with section 7 of By-law No. 430, I beg leave to submit the following report:

During the year ending November 15th, 1884, Windsor has been remarkably free from disease of all kinds. Contagious diseases, which in previous years have been somewhat epidemic, have this year been only sporadic. This is due partly to favourable atmospheric conditions; partly to the precautions taken by the Board of Health to secure isolation and disinfection, and partly to the interest taken by the community at large, to guard against disease by practising greater individual cleanliness, and by exercising greater vigilance in preventing infected persons coming in contact with the public.

Whilst there has been a general disposition on the part of the medical profession and the public to carry out the law in both letter and spirit, there are strong grounds for believing that there were concealed cases which conveyed disease to others.

Ignorance of the nature of disease was the excuse generally given when an attempted concealment was detected. This was excusable if true, but an elastic conscience occasionally caused unsuspecting neighbours and friends to contract disease which terminated in death.

Having occupied the position of Health Officer for three and a half months only, I cannot review the year's work from a personal knowledge of what has been done.

A supply of copperas and sulphur was purchased and put up in small packages, and sold at a slight advance of cost price.

A great many people availed themselves of the disinfectants, as about 1971 lbs. of copperas and 365 lbs. of sulphur were sold in two and five pound packages.

A great many nuisances have been abated by the Inspector without making an

information before the police magistrate. Only one conviction has been made, the by-law being too defective to secure a conviction in many instances of culpable neglect.

The present by-law has many defects, some of which I have already pointed out to the Board

The Statute seems to be comprehensive enough, but the by-law, schedule A, of which the town by-law is nearly a transcript, seems to be framed without reference to the Act, and is useless for practical purposes.

It seems strange that the Judicial Health Officer is not made a member of the Board. His functions are merely advisory, and he has very little executive power. Until a change is made in this respect, the Medical Health Officer will be only an expensive and comparatively useless appendage to the Board of Health. But if he were clothed with the requisite authority his field of usefulness is very large, and no officer of the corporation could give better value for his salary.

As at present constituted, the Board of Health is unwieldy with nine members; five are necessary to form a quorum, and experience has shewn that it is difficult to get this number present.

I would recommend that a house to house visit be made by the Inspector, and a description of all premises filed in the Secretary's office. This will take considerable time to accomplish, as the Inspector has other duties to perform, but can get through with the greater part of it during the winter.

All permits for slaughter-houses and offensive trades should be recalled, and only re-issued after inspection of the premises.

It will be necessary to employ two or three scavenger-carts next year. If people know that on certain days offal will be regularly taken away they would be at more pains to collect it, and there would be no excuse for allowing it to remain scattered or concealed about their premises.

J. COVENTRY,
Medical Health Officer.

SECRETARY'S REPORT.

During the year just closing the public health has been such as to afford the utmost satisfaction to all those (including, I believe, the Board of Health) who are directly chargeable with the passing and enforcing of regulations to prevent the occurrence and spread of disease within the limits of the Town of Windsor.

The construction of a number of brick sewers along thickly populated streets, where hitherto at best, only old, decaying box drains existed, by means of which sewers private premises fronting upon them have not only been effectually drained, but the surface water from large areas of low, flat sections thoroughly and rapidly carried off, no doubt contributed largely to the very gratifying result.

The efforts of the Board and its officers to induce the people at large to pay closer attention to the condition of yards, out-houses and alleys, while not as successful in many cases as was desired, have undoubtedly resulted in a very decided improvement. Resort to legal action has only been had in a few extreme cases; and with the moral effect ensuing from these prosecutions, coupled with continued exertion on the part of the Health authorities during the present winter, it is believed the people generally will in future do their part towards the complete abandonment of the old, objectionable, health-endangering habit of permitting the accumulation of garbage, horse-dung and night-soil upon their premises for an indefinite period.

It is believed that some of the comparatively few cases of Scarlet Fever and Diphtheria that have occurred during the year, have been caused by parties exposed to infection coming into town from other places, where but little attention is paid to isolation; and it seems absolutely necessary, in order to arrest danger from this source, that the Board should adopt stringent measures to prevent people so exposed mingling freely with our inhabitants.

STEPHEN LUSTED,
Secretary.

CHAIRMAN'S REPORT.

As required by section 9 of by-law No. 435, respecting the Public Health, I herewith present to the Municipal Council a report or detailed statement of the work of the Board of Health during the year, and more particularly since its organization on the 28th July last.

Accompanying herewith is the Report of the Medical Health Officer upon the sanitary condition of the town.

At the date of this, my report, I am glad to say that there are no cases of Scarlet Fever or Diphtheria existing in the town.

Since its organization the Board has held four meetings. 1,000 copies of the Health By-law, before referred to, were printed, and a large portion thereof were distributed in the town. The circular "A," mentioned in the Medical Health Officer's Report, was likewise issued by the Board and distributed to every house in town.

The consideration of the defects in the present by-law, as mentioned in the Medical Health Officer's Report, has been referred to the advisory committee of this Board, who have not yet reported as to same.

The Board purchased 1,971 lbs. of copperas and 365 lbs. of sulphur, the greater portions of which were sold, as mentioned in the annexed report. These disinfectants were also furnished gratis in many cases to poor applicants.

The amount granted and placed to the credit of this Board by your Council was $500, which, with the amount at the credit of the previous Board of Health, $300, make $800, and all accounts and salaries due by the Board to date, amounting to $541.60, having been paid, there still remains to the credit of the Board the sum of $258.40.

The building known as the "pest-house" was recently inspected, the furniture and effects therein overhauled, and an inventory of the same taken and found in good order.

FRANCIS CLEARY,
Chairman Board of Health.

OXFORD.

Woodstock.

CHAIRMAN AND SECRETARY'S REPORT.

In conformity with the statutes on that behalf, this Board begs to report as follows:—

The Board since its organization has met thirteen times, transacting considerable business relating to the sanitary affairs of the town.

An Inspector was appointed, who has made a house to house inspection, reporting to the Board at each meeting upon all matters coming under his notice.

The Board had great difficulty, when first established, in the enforcement of the removal of excreta, etc., as there was no regular way by which the inhabitants could cheaply have this service performed, but now by owning a scavenger cart and appointing scavengers under the direct control of the Inspector, this difficulty has been removed.

The Board has endeavoured to, as far as possible, educate the citizens to the advisability of doing away with cesspools and privy pits, and to adopt the dry earth system in lieu thereof, and are much pleased to know that their advice has in many instances been acted upon.

The Board very much regrets that the Town Council do not enforce the by-law against using the common sewer for water closets, etc.

The Board is pleased to know that the town has been healthy during the past year, and trusts that whoever may have the honour to belong to this Board next year will use every effort to extend the good work now begun, as we feel assured that at no great expense Woodstock can be made one of the most healthy, as well as the most beautiful towns in Ontario.

WILLIAM GREY, Chairman.
J. C. EDEN, Secretary.

SANITARY INSPECTOR'S REPORT.

I made some 456 house to house visits and found some 376 premises clean, and well-water comparatively good, and found some 80 premises unclean, and water not good, and have had 18 wells examined and found to be bad, and the same have been cleaned out and are fit for use, excepting two, namely, the well at the court house, and Mrs. Pocock's in rear of Spracklin's harness shop, the former cause being old pump logs, the latter being yard full of old privy pits draining into the well after heavy rains; the principal cause of bad water is owing to the poor covering to well, not sufficient to keep the toads out. There have been some 30 outhouse pits cleaned out and twelve filled up with earth, and adopted the drawer or dry earth system, to be emptied monthly and every three months. The following is a list of those that have adopted the drawer or dry earth system: *Sentinel Review*, Oxford Building Society, James Scott, W. H. Millman, Thomas Organ Factory, John Head, Dickenson & Cranston, Scott & Son, George Caldbeck, J. & T. Grant, Stark & Rippon, James Scarff's Central Hotel, Fred. Hayward, and D. C. Richmond. Partly filled up the others, using again as formerly. I made several visits upon hearing complaints, which were only trifling, excepting three, those being nuisances in the rear of the Royal Hotel and the Thomas Organ Factory, who complied with the law after being served with notification, excepting Mr. James King, in the matter of a slaughter-house, being inside the corporation, about 16 feet the width of the building, otherwise it is not within 250 feet of any public highway. I find that the greatest trouble is with the keeping of pigs, as people will keep them as long as the law will allow them, and a great many will not keep them as clean as they should be, thereby causing a stench to arise. There was considerable complaint that there was no scavenger to take away all kinds of offal, and people with small yards could not keep them clean as they would like, especially in the rear of the stores. I omitted to say that I inspected a number of the hotels and banks supposed to be using the sewer unlawfully, and the following are doing so: Fred Hayward, for soap suds, etc.; Imperial Bank, for water closet; O'Neil House, for the same and soap suds; Caister House, for chamber water and soap suds; Nesbitt Bros., for washing bottles; James Scott, for soap suds and water from washing bottles; Molson's Bank, for water closets; Royal Hotel, all kinds of dirty water; North American Hotel, for soap suds, etc. There are about fifty residences that have drawers or boxes in their privies, and two residences that have water closets in connection with the house, that I have inspected; they are: Dr. Springer and Mrs. Emigh. Owing to the man that was appointed to work the cart being a stranger in town, I had to take and show him where to work and see that he did it right, and did considerable running to get a place to put the material; but I did not go over the whole town as I would have liked to have done. There was so much rain this fall that I did not get so many privies emptied as I would have liked With loss of time by rain, and man being sick occasionally, and having some severe weather, the number of privies attended to looks small, but still a large amount of work was done; would take from three to five nights with two men to clean some of them. I would also mention that all new privies built in connection with new residences are made with drawer or bin for dry earth, with the exception of those in outskirts of the town. The Messrs. Bale and Sherwood have constructed theirs on the bin system; Mr. Chaplin has constructed his on the drawer plan, and connected his sinks for carrying off all kinds of dirty water by the sewer, etc. Not having a settlement with all the parties that had work done, I cannot give a financial statement to-night. Before concluding my report I would recommend the purchase of a waggon for the purpose of going around every morning, and gathering up all sweepings and offal that may accumulate from day to day, in connection with the stores.

W. H. WHITEHEAD,
Inspector.

VILLAGES.

SIMCOE.

Alliston Village.

The Local Board of Health for the Municipality of Alliston, established under the provisions of the Public Health Act for 1884, beg to report :—

That they have made no special efforts during the current year to enforce the laws relating to public health in this municipality, but are determined to perform their duties under said Act in future. With this end in view the Board had a meeting on the 7th November, at which they instructed the Clerk to get 500 copies of the Public Health Act for 1884, for free distribution among the citizens of Alliston to educate them in the vital matters of public health and the prevention of avoidable disease. This is the only practical step taken by the Local Board, in the fulfilment of their duties under the Act establishing said Board.

H. WRIGHT, Chairman.
J. C. HART, Secretary.

LAMBTON.

Alvinston Village.

CHAIRMAN'S REPORT.

Population, 1,400. Situated on the west bank of the Sydenham ; is easily drained, and the water supply is abundant at an average depth of seven or eight feet. The soil to this depth is loose and porous, hence the wells in the more densely occupied parts must be rendered more or less impure by surface water. There is a live Board of Health. The Board has an Inspector. A good deal of useful work has been done, chiefly in educating the people in sanitary matters, and the requirements of the law. The dry earth system has been adopted, and enforced with some measure of success. All privies were ordered to be cleaned, and provision was made on that behalf by the Board. The work of reformation thus begun will be vigorously continued in the spring. There is a good deal of opposition to the dry earth system. I am, however, thoroughly persuaded of its advantages over all other methods of disposal. For the schools and hotels the Board ordered water-limed vaults, constructed so as to be readily cleaned. On the whole, the sanitary condition of Alvinston cannot be said to be bad. The health of our people has been good throughout the year.

ANGUS MACKINNON, M.D.,
Chairman.

LAMBTON.

Arkona Village.

We beg leave report as follows :—That we met and organized on the 19th day of May, 1884, and immediately got out and posted up posters warning every inhabitant to thoroughly cleanse and otherwise put his or her premises in good sanitary condition, which we have much pleasure in stating has been generally complied with, and we believe this has been the quickest method to get the municipality in good sanitary condition. On the second day of July, 1884, we were so unfortunate as to have a great portion of the business part of this village destroyed by fire, but thereby further purifying the thickest settled part of the municipality.

Slaughter-houses are removed over a quarter of a mile from boundary of village, and over seventy yards from any public highway.

The Inspector reports no complaints during the year.

The Medical Health Officer reports no complaints, but advises the Board to prevent parties from taking the corpse into the church at funerals (a practice which is in vogue in country places), as being offensive and in cases dangerous.

The Board have taken action in the matter, prohibiting the practice.

He also reports the public school in good sanitary condition.

W. VAHEY, Chairman.
G. B. STEPHENSON, Secretary.

PETERBOROUGH.

Ashburnham Village.

MEDICAL HEALTH OFFICER'S REPORT.

In presenting the first annual report of the Medical Health Officer, I have pleasure in saying that during the past season no outside epidemic has visited the village, nor has there been any marked development of those infectious diseases that appear from time to time in most municipalities and are often considered unavoidable. The sanitary work done, however, has been important, not so much in itself as in directing the attention of the public to the necessity for this work in the prevention or amelioration of many of those diseases that afflict mankind.

Sanitary duties are of two kinds, municipal and individual. I am glad to say that in Ashburnham there are none of the former that demand special attention. Municipalities having neither bodies nor souls don't get sick, and are, consequently, slow to act in matters of this kind, which is apt to have an unwholesome effect on private individuals. To be sure, we should like to see good sewers carrying all the refuse of the village to a safe distance; but the majority of the houses being fairly isolated there is no pressing need for that bugbear of all rapidly growing corporations. In proportion, however, as municipal duties are light, individual duties are important, and it is in reference to these that I have most to say to-night. Many of the houses inspected were found almost as faultless as if they had a Board of Health all to themselves, but I am bound to say that in many other cases there was woeful neglect. Stables and privies were too near wells and houses, garbage was allowed to accumulate in the yards, manure heaps to fester under the very windows, with judicious sprinkling of slops, probably to prevent them from drying and being blown away. There is nothing surer than that this sort of thing breeds disease and attracts epidemics. When a wave of cholera sweeps, as it may soon sweep over the country, it will just as certainly select towns marked with these blots as a vulture will light where there is carrion. Cleanliness, first of all, is the great precautionary measure. By presenting a sanitary cold shoulder to cholera or any other plague, more lives will be saved than by all the combinations of the pharmacopœia where it has come. The usual mode of disposing of excreta is by the ordinary privy-pit. This does well enough for a time in new ground, but when the ground becomes saturated it is a source of danger to wells even at long distances, and besides, loads the surrounding air with impure and unhealthy gases. A number of those too close to the houses have been removed and the use of dry earth recommended. A good many are using dry earth in the vault, but I certainly would advise the discontinuance of the vault altogether. A simple form of earth closet can be made by any carpenter. A drawer for the deposit and a box containing equal parts of ashes and dust, of which a pint or so can be thrown on by any one using it, are all that is necessary.

The excreta may be removed at intervals, and is an admirable manure. The assimilation is so complete that it may be taken away without the slightest offence. To correct a common error, I may say that sand is useless, clay or loam dust is needed. For those

who prefer them there are various automatic kinds. One is manufactured in Peterborough by Mr. Clegg, which has the approval of the Provincial Board. A company has been started in Toronto for the manufacture of an English closet. For the sake of sanitary science, I hope we shall soon be as much pestered by agents for earth closets as by sewing machine or lightning-rod men. A great many pigs are kept in the village often for purposes of economy in getting rid of table refuse, a better way of disposing of it than heaping it up in the yard. The Inspector has had a good many removed from near the houses to the prescribed distance. A common practice is to let them run about on a soft piece of ground, which soon becomes ploughed up into an unsavoury mud salad. Instructions have been given to have these places properly gravelled and drained. There ought to be more stringent arrangements for the removal of garbage. This is not done as frequently as the law directs, and, in consequence, a good deal accumulates about houses. It should be put in a covered barrel or other receptacle, and removed at short intervals by a carter who has a personal interest in attending to it. There is but one slaughter-house in the municipality. Inspection has been regularly made, and it has always been found in good condition. One good point is that no pigs are kept, and another that all the offal is carted away immediately out of the village. I have examined some of the wells and find more or less of organic matter in the water. It should be remembered that no well water is absolutely pure. From the very nature of the case a well is a sort of a drain that attracts to it currents from all around. If properly isolated the danger is reduced to a minimum. The pleasant taste of many well waters, as compared with that from rivers and lakes, is due to the mineral ingredients and to the gases which give them sparkling properties. But it should not be forgotten that water may be clear and sparkling, and yet hold *infusoria* and *bacteria*, the frequent causes of bowel complaints, typhoid and other diseases. Filtering through the earth does not always stop this, for the efficiency of that process depends upon the purity of the filter, and who can guarantee that? Even supposing the earth to be originally pure, the very act of filtration which is constantly going on tends to foul it, and to change the filter is impossible. Hence the most rigid precautions should be taken to keep as much soakage as possible from getting into the wells. Not being in a position to secure water-works, and thus being compelled to rely on wells for a long time to come, renders care in each particular case imperative. This being the first year of the Board it was late in starting operations, so that the requirements of the statute as to cleaning of wells have not been thoroughly carried out. This should be one of the first precautions early next spring. The saw-dust nuisance is an important one, but does not claim much notice here, as it forms the subject of a circular from the Provincial Board. As I said in the report to the Peterborough Board, what concerns us is this—That half a dozen saw-mills are discharging into the Otonabee River an amount of saw-dust equal to about ten per cent. of their output of lumber, that a large quantity of this finds its way into the Little Lake and remains there, that there it is mixed with sewage and refuse of all kinds from the town and surrounding shores, the filling up going on slowly but surely; so that to say nothing of present annoyances there is great danger of the lake being ultimately converted in part or in whole, from a beautiful sheet of water, admirable for purposes of recreation, into a vast malarious marsh compared to which Spaulding's Bay would be a rose bed. Strong measures ought to be taken. A law was passed some time ago to protect fish; let us have something now to protect men. The condition of the village streets demands a word. Though comparing favourably with those of other places, too much refuse finds it way from the houses and is ploughed up by the mud, by and by decaying and being blown into people's lungs the first dry and windy day. A little care, public and private, would lessen that materially. A house to house inspection in accordance with a form issued by the Provincial Board is being carried on. The minuteness of the details necessitates considerable time for its completion. A number of notices have been served in cases of nuisance, but have been complied with, so that no prosecutions were needed. Regarding infectious diseases, a few cases have occurred. When reported, placards have been put up. On enquiry I find that some unreported cases have occurred, principally, I suppose, from inadvertence on the part of the medical attendant. An occasional reminder wil rectify this in future, and the obvious advantages of the law will lead placarding to be looked upon with less disfavour, and encourage both medical men and

the public to co-operate in the isolation of infectious diseases. I may say that typhoid fever cases are not placarded. It is not a contagious disease in the same sense as small-pox. In the hospitals typhoid cases are placed in the public wards indiscriminately with others. In conclusion, I think a good commencement has been made. People's attention has been aroused, and that is a good deal in itself. Education is better than force, for it is the gradual upbuilding of the strongest force of all. To give every man, woman and child in the municipality a sanitary conscience, an intuition or instinct, call it what you will, keen enough to recoil from all uncleanliness, and the manifold forms of sanitary error, as from the face of a serpent, ought to be the supreme object of every Board of Health. I intend next spring to write a series of letters to our newspapers dealing with sanitary subjects around us in a practical manner. The circulars of the Provincial Board are issued in too small quantities to be of any real service. If the public can get useful information, the stimulus of mutual improvement will enable them to profit by it, and in other years we shall see as little necessity for compulsion as I am glad to say we have seen in this one.

J. C. CLARKE, M. D.,
Medical Health Officer.

Detailed account of sanitary work done in the Village of Ashburnham for the year ending 15th November, 1884 :—

No of closets removed	22
" yards cleaned	37
" pig pens removed	20
" wells cleaned	18
" manure heaps removed	13
" deposits of surface water, drained	8
" hen house removed	1
" rubbish heaps removed	12
" notices served	21

Infectious diseases reported :—

Typhoid Fever	1
Scarlet Fever	3
Cases placarded	3

ELGIN.

Aylmer Village.

SANITARY INSPECTOR'S REPORT.

In reply to your request I take pleasure in stating that since the formation of our Sanitary Board of Health in May last, I have made twenty-seven visits, and succeeded in removing the only two slaughter houses that were inside the corporation outside the village limits ; also a number of pig styes and hen pens to greater distances from private residences, and having the premises properly cleansed.

But the greatest nuisance that I have found in our village is the privies, which I have had some difficulty in getting properly cleansed and arranged. In the majority of cases the people appear to be willing to comply with our request, but are at a loss to know how to proceed, from the fact that labourers refuse to perform such work as cleansing and arranging them.

I have very strongly recommended the dry earth closet, and in some cases have succeeded, and hope during next spring and summer to succeed in getting this system generally adopted throughout our village ; and upon the whole our premises have been considerably cleaner than they were in the past. We gratefully acknowledge that during the past season our people have been quite free from all kinds of epidemics, and the death rate has not been large.

J. E. McDONALD, Sanitary Inspector.

LINCOLN.

Beamsville Village.

SECRETARY'S REPORT.

One of the provisions of *The Public Health Act, 1884*, requires the Secretary to draft an Annual Report of the work done, and of the sanitary condition of the municipality, and lay it before you for consideration and adoption.

We had no meeting later than the 6th September last, and it did not then seem necessary to prepare a report, nor indeed was the business of the Board then closed for the year. No report was therefore brought in, and the present is the first opportunity there has been for submitting my report of the work of this Board for the year 1884.

The Municipal Council acted upon the law, assented to on the 25th March, promptly, and appointed members of the Local Board, Medical Health Officer, and Sanitary Inspector, on 5th May. Owing, however, to refusals of some the Board was not completed until June, and all through the year was deprived of the counsel and services of a Medical Health Officer.

The first meeting was held 19th May, at which James Paton, Esq., was elected chairman. At this meeting public notice was directed to be given that a close and general inspection of all houses, barns, cellars, wells, water closets, etc., would take place on or about the 10th day of June, and requiring the removal of manure heaps and garbage, the cleaning of hog pens, and the thorough cleaning and deodorizing of privies. A second meeting was called for Saturday evening, 12th July, but owing to absence of members, no business was transacted.

The next meeting was held July 17th. At this meeting the Sanitary Inspector reported verbally that he had made the house to house inspection required, and that the condition of things as he found them was satisfactory in nearly every case. The exceptions reported were five in number, three in respect of violations of Rule 7 of sec. 14 of the Statutory By-law, providing that between 15th May and 1st November no hog shall be kept within the limits of the municipality, except in pens 70 feet distant from any house, with floors kept free from standing water, and regularly cleansed and disinfected. The two other cases were the condition and situation of privies. The Board directed the Sanitary Inspector to give the parties occupying the premises the necessary notices, stating in each case a reasonable time within which the nuisance should be abated.

A fourth and last meeting was held on 6th September. At this meeting there were four cases of violation of the by-law reported, and the Inspector further reported that the parties though warned refused to conform to the law. The Board thereupon directed the Inspector to prosecute any who, after one more notification did not meet the requirements of the law, and all the parties at the last moment did satisfy the Inspector and obey this most righteous law, enforcing cleanliness and decency. A single prosecution for breach of the law was pushed to conviction. The penalty and costs of prosecution were made without issue of final process. In this the offender was guilty of breaking section 8 of by-law.

Such in brief is a narrative of the first year's work of the Local Board of Health of the Village of Beamsville. The sanitary condition of the village, it is pleasing to report is very good. There was in the year a single case of Diphtheria of a mild type, and there was among children a few cases of Diarrhœa (four resulting fatally) in the early weeks of the fall, otherwise the village was remarkably healthy through the whole year.

In commenting upon what has been done, I may be permitted to say that the Inspector and Board having new work thrown upon them have probably acted wisely in erring, if they have erred, on the side of leniency and slowness. At the beginning the importance and desirability of a Local Board of Health, armed with ample powers to enforce its mandates, was not understood, nor had the Board in its first work the moral support of all the villagers. The inquisitorial character of the house to house inspection and the considerable number of tolerated nuisances that in the shape of hog pens, privies

and slaughter houses, had been for years an offence to, and matter of protest by those living on adjoining lots, made the enforcement of the Act with some seem ungracious and tyrannical. It may be, therefore, that it was well last year to move slowly and suffer long with those who were offending. But the whole value of the Board of Health will lie in just the opposite direction. Nuisances affecting the comfort and health, possibly the lives, of neighbours must be vigorously and swiftly dealt with. A manifest wrong is done, it may be an irreparable loss is inflicted, by permitting breaches of the Act to continue for a day. In all clear cases of violations of the law there should be prompt prosecution of the offending parties.

I may also suggest that there should be much more of methodical detail and minutiæ on the part of the Inspector in his examination of premises. His memoranda be taken down on the spot. Every part of the premises should be visited and examined by him personally and reported on, and nothing be taken on trust from others, and no house should be passed over, but the examinations should be equally close and thorough in all.

ROMAINE VAN NORMAN,
Secretary.

ESSEX.

Belle River Village.

SECRETARY'S REPORT.

Yours is to hand, and in reply would state that the Board of Health of this corporation did not find it necessary to apply the law to its full extent, on account that this corporation is so small, and there was no Medical Officer appointed, so I cannot make any report for this season. The only objection that there was here against the rule of the Board was a slaughter-house. The owner was fined, and every thing is satisfactory to the Board at present.

A. HAMEL,
Secretary.

PEEL.

Bolton Village.

CHAIRMAN'S REPORT.

I have the honour to inform you that as soon as it became known that a Board of Health had been appointed in this municipality, the inhabitants commenced putting their houses and premises in proper order, and what was clean before was made cleaner.

Only upon one occasion was the Inspector called upon to see to the abatement of a nuisance. Upon being notified, the party immediately removed the nuisance.

The village is in a good sanitary condition, no infectious or contagious disease having been present during the summer or autumn months.

Owing to the removal of the Medical Health Officer from the village to the City of Toronto, no report from him can be forwarded.

GEO. SMITH,
Chairman.

MUSKOKA AND PARRY SOUND.

Bracebridge.

MEDICAL HEALTH OFFICER'S REPORT.

In accordance with my duty as Medical Health Officer of this municipality and your request, I beg to lay before you as briefly, and at the same time as accurately, as possible a statement of my observations and experiences during the past six months.

While I have reason to congratulate the Town Council on the selection they have made in appointing the members of this Board and the work which they have accomplished, I cannot help urging upon you the necessity of further extending your usefulness, as members of this Board, to a careful and systematic study of sanitary science, school hygiene, and all matters pertaining to the public health; and this by an earnest and rigid enforcement of the Health Act, so wisely and so well framed by the Legislature for the prevention and spread of disease; for the safety, welfare and comfort of our people, which, if carried out properly, will render invaluable services to the public good.

During the time in which I have had the honour to act as Medical Health Officer of this municipality I have frequently had my attention drawn to low-lying lots, to accumulations of filth and garbage, and other unsanitary conditions prevailing in our midst. In a village like this where a proper system of drainage does not exist such evils as these are dificult to remedy, although, I must say that in all cases where it was possible under ordinary circumstances to improve the condition of affairs, the authority of this Board has been duly recognized and the order of the Inspector promptly obeyed.

But besides surface accumulations, we have another and more potent evil to contend with, and that is sub-soil dampness, which makes thorough drainage indispensable, and the inspection of your cellars an important part of the Inspector's duties. The removal of water, dampness or moisture of any kind, from around, about or underneath their dwellings ought to be the first and most important household duty of every family.

With regard to the water supply of this village, I regret to say that it is far from being all that could be desired; many of our wells are dangerous in many respects, some being low, giving surface water free access, others in too close proximity to privy vaults, manure heaps and other decomposing matter allowing the possibility of access of infectious germs, which must necessarily contaminate the water and render it unfit for use. I would suggest that a most thorough inspection of all the village wells be made at the earliest possible date, and a chemical analysis of the different waters be had.

With regard to the disposal of excreta, there is again the disadvantage of the want of a proper system of sewerage, which renders it useless to speculate on the possibility of any material enforcement in this respect. Under this head, however, I must say that the requirements of the Act have been satisfactorily carried out, thanks to the vigilance and energy of the Inspector who has been most active in regard to this important part of his duty.

The disposal of garbage is a matter which not only ought to be of interest to every householder, but should also claim the attention of this Board as being a matter of great importance, pertaining as it does in no small degree to the maintenance of the proper sanitary condition of our premises, which it is the chief object of this Board to preserve, as decomposing organic matter in the presence of heat and sunlight is one of the most fruitful sources of those poisonous germs, the frequent cause of summer complaints, typhoid and other fevers. While on this point I desire to call the attention of the Board to the existence of a very unsightly and unsavoury article, in the shape of a manure heap deposited on the public highway in front of one of our hotel stables, which not only obstructs the sidewalk, narrowing it until it is impassable, but actually renders existence in its proximity next to impossible from the offensiveness and foulness of its odour, a condition of things which should not be tolerated for a moment, and which I hope will receive the immediate attention of this Board.

On the whole, I am of opinion that the present sanitary condition of the village is as satisfactory as could reasonably be expected under existing circumstances. We have for the

past six months at least, enjoyed a comparative immunity from contagious disease, there having been but two cases of typhoid fever come under my notice, both of which I believe were contracted elsewhere: and although several cases of low continued or bilious remittent fever have occurred, small-pox, scarlatina, diphtheria and other malignant types have been unknown to us, nor has a single case of malarial fever been known to exist, a condition of things which does not obtain in the adjacent townships, as in the township of McLean, in the vicinity of Trading Lake, some eighteen or twenty cases of a mild typhoid, some of which exhibited certain well marked malarial tendencies, have come under my notice.

With regard to vaccination, the requirements of the Act have as yet been carried out by some 75 out of 380 persons, as reported by the Inspector not vaccinated up to July 15th. This may be partly accounted for from the fact of the weather being so warm during the summer months, that it was deemed not advisable to enforce the law with regard to vaccination.

In concluding my report I must say that every credit is due the Inspector for the very thorough and efficient manner in which he has performed his duty, and would strongly recommend that in the interest of this Board and in the interest of this municipality, from a sanitary point of view, his services be again secured and his present, though very high, salary be increased.

All of which is respectfully submitted.

WM. F. SHAW, M. D.,
Medical Health Officer.

CHAIRMAN'S REPORT.

As Chairman of the Local Board of Health of the Village of Bracebridge, it is my duty to present to you a report of the work done by the Board of Health since its formation, and of the sanitary condition of the municipality.

A Sanitary Inspector and a Medical Health Officer having been appointed by your Council, a resolution was passed on the second day of June last that the Sanitary Inspector at once make a thorough sanitary inspection of the village, and report to the Board at the next meeting nuisances of every description existing in the village: also the names of all persons between the ages of three months and twenty-one years who had not been vaccinated.

The Board at once issued placards, that all persons desirous of keeping pigs or cows within the limits of the village must first obtain permission from the Board of Health, and also gave notice that the Medical Health Officer had fixed certain times and places for the purpose of vaccination.

Permits have been issued to thirty-two persons to keep cows, and eighteen to keep pigs within the municipality, upon complying with the by-law.

On the 8th August last a case of typhoid fever was reported to the Board by Dr. Bridgeland. Steps were immediately taken to disinfect the house where the patient was, and a notice in accordance with the by-law was posted upon the house and remained there until the patient was convalescent.

The Inspector reported a number of cases of unsanitary condition of premises, chiefly water-closets and manure heaps, but in every instance the parties complied with the law upon being notified so to do.

A second case of typhoid fever is mentioned in the Medical Health Officer's report, but it was not brought to the notice of the Board.

It is a matter for congratulation that so very few cases of infectious disease have occurred, and that the general health of the municipality has been so good during the past seven months: a state of things which, under God, I believe is largely due to the exertion of the Board and its officers, especially when it is considered that the influx of several hundreds of the labouring class, and the overcrowding of many of the houses, is likely to promote or aggravate disease.

I desire to call the attention of the Council, and especially the incoming members of the Council next year, to several suggestions contained in the Medical Health Officer's report,

and also to the legislative and increased powers of Municipal Councils passed since the Public Health Act, and would recommend the Council of 1885, in view of the possibility of cholera invading the Province next spring, and the number of cases of small-pox at present existing in the Province, and the number of strangers in our midst employed upon the railway now in course of construction, to rigidly enforce the provisions of the Public Health Act, and the by-laws of the municipality in regard to the public health : and I trust that during the coming year the inhabitants of the municipality will do all in their power to assist the Board of Health in enforcing the Public Health Act, and will be blessed with as good health and freedom from infectious disease as they have been during the past year.

ALFRED HUNT,
Chairman.

HALTON.

Burlington Village.

MEDICAL HEALTH OFFICER'S REPORT.

The village has been exceptionally healthy this summer, and I think that is partly owing to the sanitary measures that have been taken. The inspector has seen that all manure has been removed from the stables from time to time, as it accumulated : also all the pig styes regularly cleaned and kept at a distance from the house, as prescribed by the Act ; also he has had the privies cleaned out and chloride of lime freely used, and several other minor nuisances removed, as I directed. There have been two cases of Typhoid Fever, one of Measles ; no malarious fevers, and the Typhoid cases were imported. There have only been four deaths registered here, two from senile decay, one from consumption, and one an infant, cause unknown. There has been lately a change in the clerks, and things are not quite settled.

A. CARTER, M.D.

ONTARIO.

Cannington Village.

CHAIRMAN AND SECRETARY'S REPORT.

The Local Board of Health of the Village of Cannington beg to report that they have been organized as a Board of Health since the month of June of the present year ; that they have appointed a Sanitary Inspector ; that the Chairman of the Board being a Medical gentleman, they considered that it would be sufficient for him to take the oversight, without appointing a Medical Health Officer.

As soon as organized they at once had notices printed instructing the inhabitants of the village to have their outbuildings, water closets, cellars, yards. and premises cleaned from all refuse or noxious matter, by burning or burying the same, and to have all privies and water closets properly deodorized or disinfected.

That the Sanitary Inspector has very efficiently seen that the foregoing instructions were complied with, and now reports that the village is in a very satisfactory condition, as far as the carrying out of the provisions of *The Public Health Act* is concerned.

The Board has also to report that they have been ably sustained by the Municipal Council of the village, in their efforts to enforce the provisions of *The Public Health Act* in this municipality.

D. GILLESPIE, M.D., Chairman.
GEORGE HORNE, Secretary.

HALDIMAND.

Cayuga Village.

CHAIRMAN'S REPORT.

The Board of Health of the Village of Cayuga, beg to report as follows :—

The Board was organized on the 10th day of May by the appointment of a Chairman and Medical Health Officer, and arranged for an inspection of such places as it was thought required attention. The Board met again on the 5th day of July, and proceeded to inspect the public and high school premises, giving directions for the removal of refuse in the basement of the high school, and for the disinfection of the closets.

The high and rolling land on which the village is built affords excellent natural drainage, but on a few streets surface water was found, and directions were given for immediate attention thereto.

Water for domestic use is chiefly supplied from wells and cisterns, but the isolated position of most of the buildings renders it safe from pollution through drainage. A few dry earth closets are already in use in the municipality, and it is recommended that steps be taken to make their use general.

There has not been a case of infectious or contagious disease in the municipality during the past season, and the usual malarial affections which prevail along the valley of the Grand River during the summer season have been but few, and of a very mild form.

J. BAXTER,
Chairman.

HURON.

Clinton Village.

SECRETARY'S REPORT.

The drainage of the town is effected by open drains, and they are with difficulty kept clean. The Board have not had funds placed at their command to do what they have thought best to be done. The Council have been applied to with reference to one of these drains, specially polluted with sewage, and which the Board consider a very great nuisance, but the Council have failed to do anything in the matter. A Sanitary Inspector was appointed and a thorough inspection was made by him. No Medical Health Officer.

J. CALLANDER,
Secretary.

HALDIMAND.

Dunville Village.

CHAIRMAN AND SECRETARY'S REPORT.

The Board immediately after being appointed met and organized by appointing James Scholfield, sen., as Chairman, and J. W. Holmes as Secretary, and after mature deliberation resolved upon a house to house visitation. This conclusion was arrived at because of no Medical Health Officer or Sanitary Inspector being appointed, and it was thought a consultation by the full Board of each case requiring attention would be preferable. The objects which have engaged the attention of the Board have been the general sanitary condition of the village, which, upon our first visit, was found to be in a very neglected condition. We found the greatest trouble to arise from a want of system in the deposit of vegetable and other refuse, in nearly every case it being thrown in the back yards, there to decay. As a remedy in this case we recommended all such to be removed at once, and in most cases the people did readily comply. Surface wells and wood cisterns

being the chief water supply, we found privy vaults a very difficult matter to contend with. In most cases holes are dug and lined with inch boards or plank, and of course not being water-tight the ground was saturated with the liquid, which, from the sandy nature of the soil, has no difficulty in draining into and contaminating the wells or cisterns. There has not been any definite method adopted to remedy this evil, and the Board feels that unless earth closets, such as are recommended by the *Sanitary Journal*, be adoptod, this evil will continue; but to enforce this is a very difficult and will be an expensive undertaking. The Board, as a temporary relief, insisted upon all vaults being thoroughly disinfected about every two weeks, and they had to make frequent visits in order to enforce this. There being no village by-law in reference to privy vaults, the people were taken by surprise, and in some cases very reluctantly complied with the order of the Board. This section has not been visited with any serious illness except Scarlet Fever, and of this we have had fourteen cases and three deaths reported; however, to what extent the disease can be traced to polluted wells we are unable to say, but firmly believe the disease has been fed by contamination with foul drinking water. We supplied each doctor in our district with slips to report disease such as is enumerated in your list, and gave strict instructions to watch and require each person who has any cause to enter the sick chamber to use disinfectants before going out, and to prevent, as much as possible, any person going into public. We also posted notices, as recommended by you, upon receiving information from the doctors of any disease; we also notified the principals of the high and public schools, so they could prevent any child from going to school who was likely to be near such disease. The precautions taken this year have no doubt been very beneficial in at least reducing Fevers and Diphtheria, as the number of cases reported this year is considerably less than last report, but we feel that even greater vigilance is absolutely necessary in view of the probable visitation of Cholera next year; and from the slight fall for drainage in this village there must be a careful supervision of all precautions which can be applied to the proper cleaning of all foul matter which would likely contaminate the drinking or other water for family use.

JAS. SCHOLFIELD, Chairman.
J. W. HOLMES, Secretary.

OXFORD.

Embro Village.

SECRETARY'S REPORT.

Our municipality is in an extremely good sanitary condition. The Board of Health, including a M. D., carefully inspected all premises, and caused every nuisance likely to endanger the public health to be removed or destroyed. We opened a book of complaints; when any person knew of any nuisance it was recorded, and said nuisance immediately attended to by the Board.

E. ODY,
Secretary.

HURON.

Village of Exeter.

MEDICAL HEALTH OFFICER'S REPORT.

I beg leave to enclose my first report which is very imperfect, having a great many difficulties to contend with in introducing a new system in this place.

About the first week in August a Health Board was organized in the Village of Exeter, and a Medical Health Officer appointed, who was also chosen Chairman of the Board.

A few days after organization an inspection was made by the Board in a body, who inspected the hotels and livery stables, as also the school house, where everything was found in a satisfactory condition with the exception of the pig pens, which were clean but not placed at the proper distances from dwelling houses. The hotel-keepers at once disposed of their pigs, thus getting rid of this nuisance.

The next matter to engage the attention of the Board was the filthy condition of the privies, and in a great many cases their too close proximity to wells, not being more than thirty or fifty feet away. This matter has been pretty well attended to, and we hope to make a great improvement in it next year. Three cases of typhoid fever, one of diphtheria and five cases of whooping cough, have been reported. More cases of whooping cough were in the town, but did not receive any medical treatment. A creek runs through the south end of the village, which is fed about six months of the year from a swamp about half a mile out of the town; this creek in the dry months of summer is a receptacle for filth and stagnant water, and measures are to be taken to remedy this next year.

I would state in conclusion that the Board met with a good deal of opposition in carrying out any sanitary measures.

JOHN H. HYNDMAN,
Medical Health Officer.

MIDDLESEX.

Glencoe Village.

SECRETARY'S REPORT.

The work required to be done by our Local Board of Health during the past year has been so trifling that their report must necessarily be brief. During the entire year there has not been a single complaint from any source laid before us—and the only work done at the instigation of the Board, was the construction of a short sewer through the back yards of a few premises, where stagnant water was found in wet seasons. Our village has not suffered from any malarial or contagious diseases this year, but, on the contrary, has been remarkably healthy. I might say that our Municipal Council has exercised considerable care and vigilance in keeping the streets, and lanes clean and promptly suppressing any business about to be carried on which might endanger the health of our citizens.

GEO. M. HARRISON,
Secretary.

LINCOLN.

Grimsby Village.

CHAIRMAN'S REPORT.

In accordance with sub-section 3, "Schedule A" of the "Public Health Act, 1884," I beg leave to report as follows:

At the first regular meeting of the Board held in June, various matters pertaining to public health were discussed, and certain measures were adopted, in order to carry out as far as possible the spirit of the law in regard to sanitary reform; among which were the printing of certain sections of the Health Act in pamphlet form, for distribution among the people, so that they might not be able to advance the plea of "ignorance of the law" as an excuse for "breaking the law."

At the next meeting held July 31st, a resolution was adopted recommending Mr. John Duval, Senior, for appointment as Sanitary Inspector, the Council up to this time not having appointed one. It was also decided to purchase 100 copies of the pamphlet "On the Disposal of Sewage," issued at a cheap rate by the Provincial Board. These were subsequently sent to those citizens who would be most likely to read them, with the

hope that the influenced citizens might be induced to co-operate with the Board in their endeavour to popularize the subject of Public Hygiene, and also to assist by *example*, which is known to be more powerful than precept.

The Sanitary Inspector, owing to severe illness shortly after appointment, was able only to make a partial inspection of the village.

Upon the whole, I believe, considering the difficulties met with in carrying out the radical changes proposed by the new Act, that the Board have accomplished considerable good during the short period they have been in office.

The "Dry Earth System" has been adopted by many who formerly used "pits" in disposal of excreta. Where "pits" are still used, they have been removed to greater distances from wells and dwelling houses, old pits emptied, and filled up with clean earth.

Fortunately, we have not been visited by any contagious epidemic during the past six months. Had we been, the Board was prepared to enforce isolation of the sick, and other regulations necessary for the protection of the well.

R. A. ALEXANDER,
Chairman.

WELLINGTON.

Harriston Village.

MEDICAL HEALTH OFFICER'S REPORT.

A meeting of our Local Board was held 4th December, and on the 5th the Chairman reported to the Council as follows:

"The Local Board of Health beg to report that in compliance with the statutes in that behalf, soon after the formation of the Board, the Sanitary Inspector caused notices to be posted up, notifying all owners and occupiers of houses and premises to have their yards and outside houses properly cleansed; and subsequently made a personal inspection of several places likely to engender disease, and caused the same to be cleaned. Since then, he has visited some places where typhoid fever was said to exist, and found some cases of fever, but as each case was in a favourable way towards recovery; he did not consider official interference necessary"

On the 6th December, inst., I received a communication from the Medical Health Inspector, of which the following is a copy:

"In compliance with the Act requiring me to make an annual report to the Board I submit the following:—During the past year there have been no reports; as directed by the 49 section of the Public Health Act of 1884, from the resident medical men of the prevalence of any contagious or infectious disease within the municipality, with one exception, and that was a case of typhoid fever, which, owing to the precautions taken, was confined to the house in which it appeared; and as there have been no complaints of existing conditions that are likely to be productive of disease, I can have no hesitation in congratulating the Board upon the general good health and excellent sanitary arrangements that exist.

"W. A. HARVEY, M. D.,
"Medical Health Officer."

SECRETARY'S REPORT.

The sanitary and health conditions of the village are favourable, which in a large measure accounts for what might be considered laxity of the Board, and the absence of reports in more strict conformity with the legal requirements.

I feel justified in predicting that with the commencement of duties of the next municipal year; more active application will be devoted to these matters by the incoming corporation representatives.

M. P. EMPEY.
Secretary.

PRESCOTT AND RUSSELL.

Hawkesbury Village.

SECRETARY'S REPORT.

A Local Board of Health has lately been organized for this village, and has a Medical Health Officer.

I have to report that the privies are in a number of cases too close to wells, but, so far as I know, no disease has been traced to this condition. There have been several cases, both of Scarlet and Typhoid Fever during the year, and in these, as in all cases of infectious disease, disinfectants have been used. There are no slaughter-houses in our village.

A. J. PARKER,
Secretary.

NORTHUMBERLAND AND DURHAM.

Hastings Village.

SECRETARY'S REPORT.

The Board met on June 25th and 28th, and July 7th and 18th.

The business transacted was first to make a general tour of inspection regarding drainage, and any other business connected with the general sanitary state of the village.

Drainage and other work was started and inspected by the Board at the other meetings of June 28th and July 7th and 18th, when good work was done, and our village has been and is now in a good sanitary state.

The Inspector has reported to me that he has during the season made fifteen official visits in different places in this municipality, and states that the village is in a clean and very healthy condition.

JOHN SHARPE,
Secretary.

ESSEX.

Kingsville Village.

MEDICAL HEALTH OFFICER'S REPORT.

In submitting my report, I feel that it is unnecessary to apologize for its brevity, but rather consider it a matter for congratulation that the sanitary condition of the village has been such as to render a lengthy report uncalled for. During the past year there have been no cases of any disease of a contagious or epidemic nature. This fact appears the more singular and noticeable when we are reminded that in various localities within a radius of not more than ten miles zymotic and malarial diseases have been prevalent, the death-rate from which has been large.

The causes of our immunity from these afflictions, in my opinion, are not far to seek. Undoubtedly the primary reasons for the healthfulness of the place, are—1st, the excellent natural drainage; 2nd, the porosity of the soil; 3rd, from the situation of the village, an elevated ground with the lake to the south, the prevailing wind being south, the air is of necessity pure and untainted with malarial or other noxious impurities. Now, while we may contemplate with satisfaction these natural advantages of our village, it is none the less important that the Board should be vigilant in the observance of those precautions which, if neglected, might nullify them. Perhaps the first in importance of

those precautions is the prevention of the pollution of the soil in the neighbourhoood of the water supply; because, whereas the porous nature of the soil is a benefit as an aid to drainage, yet, that very porosity facilitates the contamination of wells from contagious privy-vaults or other sources of impurities.

Considering the fact that this is the first year of organization of the Board, I have to commend the Board and Inspector upon the degree of efficiency exhibited in the performance of their duties, yet there are some matters of considerable importance yet unattended to.

S. A. KING, M.D.,
Medical Health Officer.

LANARK.

Lanark Village.

CHAIRMAN'S REPORT.

The Local Board of Health for the Village of Lanark, in submitting this their first annual report, have much pleasure in being able to state: That there has not been during the past year any case of Smallpox, Scarlet Fever, Measles, Diphtheria, Whooping-cough, or Typhoid fever—a fact which, in the opinion of this Board, is evidence of the good sanitary condition of this village, and obviates the necessity of making such an extended report as would have been found necessary had any of the diseases above mentioned prevailed even to a moderate extent.

T. B. CALDWELL,
Chairman.

MIDDLESEX.

London West Village.

CHAIRMAN'S REPORT.

I have the honour to present herewith the first annual report of the Board of Health of this village, including the report of the Medical Health Officer and Inspector. The year being so far advanced when the Board was appointed, and especially as regards the appointment of Medical Health Officer and Sanitary Inspector, this report will consequently be brief and somewhat incomplete, especially as their attention has been mainly taken up in the hearing of evidence with reference to the great public nuisances caused by the Blackfriars and water works' dams, the said nuisances having been complained of in two petitions presented to the Board by the ratepayers of this municipality, praying for the abatement of the same. With reference to the first-named dam, the Board, after hearing the evidence presented to them, were satisfied that a nuisance did exist, and notified the owner of the same to abate the said nuisance in a given time, which, not being done, the evidence as taken was forwarded to the Provincial Board, and no doubt will be dealt with at an early date.

In the matter of the nuisance complained of, caused by the water works' dam, your Board, having heard the evidence submitted to them, consider a nuisance does exist, and have ordered that the Board of Water Commissioners be notified to abate the same within one month from date of notice.

Your Medical Health Officer reports that he has visited the schools, and that he found the same in a good sanitary condition; also, that the village generally was in a clean and good sanitary state, with the exception of the river, which he considered was in a bad state, but owing to the short time that he had been appointed, he had not sufficient data to found a report on.

Your Sanitary Inspector reports having visited 47 premises, out of which he found people using water from 13 wells that was not fit for use, some of which had not been cleaned out since the flood of 1883; the owners of said wells, after being notified by him, in each case had them cleaned out, making them fit for use.

Your Board would earnestly urge upon you that steps be taken to have the village placed in a good sanitary condition, by doing all in your power to have the obstructions in the river removed, so that the filth may have a chance to be washed away.

R. F. LACEY,
Chairman.

YORK COUNTY.

Markham Village.

MEDICAL HEALTH OFFICER'S REPORT.

I am pleased to report the great improvement in the sanitary condition of the municipality, due to the prompt and energetic action of your body when any violation of the By-law was brought under your notice, thereby causing its immediate removal or suppression, and to the co-operation of the public in endeavouring to carry out its provisions. Particularly is this improvement noticeable in my own immediate neighbourhood, where formerly the effluvia arising from the slaughter-house and offal-fed pigs were extremely sickening; but, thanks to your action and persistent interference, this has been reduced to a minimum, and in many other places it is also self-evident.

The one remaining nuisance exists in the shape of privy-pits. The existence of such a number (many of them never being cleaned, but when full covered over with earth and the closet placed over a fresh one), cannot but be injurious to the health of the public, situated as they are in such close proximity to our wells and dwellings; and I would strongly urge upon you the advisability of making the adoption, in the near future, of dry-earth closets compulsory, as is now done in several municipalities. The dry-earth system involves but a slight additional expense to each freeholder, with very little increased trouble to each householder, when compared with the incalculable benefits derived from it.

Trusting this will receive your serious consideration,

W. ROBINSON,
Medical Health Officer.

SECRETARY'S REPORT.

The Local Board of Health for the Village of Markham, in the County of York, beg to present their report for 1884.

The Board held its first meeting on the 26th day of May, 1884, at which H. R. Wales was duly elected Chairman.

On motion, the Sanitary Inspector was instructed to make a thorough examination, as required by by-law, of the entire village, of all premises, etc., therein.

On the 27th day of June the Board met to receive the reports of the Health Officers and Inspector.

The Sanitary Inspector reported that he had made a thorough inspection, as required by by-law. On his first visit there was much to complain of. He gave all parties notice to put their places in such order as was required by law. The second inspection he made the week following, and was pleased to report that, with few exceptions, the householders had conformed to his instructions. On his third inspection, there were only some seven places left in an unsanitary condition. The cellar of Dr. Smith was half filled

with water ; the back premises of Roundtree, butcher ; Mair's Hotel, stable and yards. Ditch in front of A. Mair's law office wanted opening. The old house belonging to D. A. Milne (unoccupied) was simply a pest house, and required immediate renovation ; also, the slaughter-house and premises of P. Glen, butcher.

Dr. Robinson, Health Officer, also reported, recommending dry earth closets ; also, that vaults. cess-pools and drains remaining uncleaned be cleaned and deodorized by the use of sifted ashes, etc.

The third meeting of the Board was held on the 1st day of August, 1884. Members all present.

The Inspector reported having made three inspections and found the village in a satisfactory sanitary condition, with the following exceptions : Dr. Tefft and Dr. Smith's cellars were still undrained. Being rented property, the owners refused or neglected to put in drains, and the filthy state of the following premises : Blakely's hog-pen, Jerman street ; J. Quinn's hog-pen, Jerman street ; P. Glen's hog-pen and slaughter-house, Main street, and Commercial Hotel stables. The Board, as a body, inspected the above-named premises, and, on motion. instructed the Inspector to notify the parties to remove all nuisances within five days, and to lay information at once and prosecute P. Glen for keeping his premises in so filthy a condition. Board adjourned to meet on call of Chairman.

The fourth meeting was held in Town Hall, on August 28th. Members all present, Chairman presiding. Minutes of previous meeting read and confirmed.

Reports from Health Officer, recommending the removal of pig-styes from the premises of Blakely and Quinn, being injurious to public health ; also, from Sanitary Inspector. reporting that the said parties, in addition to J. White and T. Woolten, refuse to comply with by-law.

The Board again made a personal inspection of premises complained of, and, on motion, ordered the Inspector to give notice to the parties to remove the nuisances within two days, they failing to do so to prosecute at once. Board adjourned.

The fifth meeting of the Board was held in the office of C. E. Fenton, Sanitary Inspector, on Nov. 29th, 1884.

Reports from Health Officer and Sanitary Inspector, which find herewith attached.

Mr. Vanzant moved, seconded by Mr. Fleury, that the reports of the Health Officer and Sanitary Inspector be received and adopted. Carried.

Mr. Vanzant moved, seconded by Mr. Fleury, that the Sanitary Inspector be paid twenty-five dollars for services for 1884. Carried.

On motion the Board adjourned *sine die*.

We may add that in every case the parties complained of complied with the instructions of the Board, hence there were no prosecutions, excepting in the case of P. Glen. Prosecution was commenced in that case, but he, on receipt of summons, immediately removed the nuisance and prosecution ceased.

There were no cases of Diphtheria, Small-pox, Malignant Fevers, during the season, so far as known to the Board.

I herewith send report of Health Officer and Sanitary Inspector.

H. R. CORSON,
Secretary.

SANITARY INSPECTOR'S REPORT.

It is with pleasure that I have to report to you that the village is at the present time in a good healthy condition. There have not been any complaints for the last month, and all the wells, cisterns and privies that were in a filthy state I believe are cleaned.

Disease has not been so prevalent as last year. In looking over other reports, I find that Markham has been favoured with the best of health in comparison to other villages. There have been only a few cases of Dysentery and Diarrhœa.

C. E. FENTON,
Sanitary Inspector.

STORMONT, DUNDAS AND GLENGARRY.

Morrisburg Village.

SECRETARY'S REPORT.

The health of this village is good, and the Local Board of Health fortunately was not called on to go to much trouble, other than having an inspection carried out which, on the whole, was satisfactory.

JOHN FETTERLY,
Secretary.

LEEDS AND GRENVILLE.

Newboro' Village.

SECRETARY'S REPORT.

The Local Board of Health have directed their attention to the disposal of a pit containing carcasses of dead animals, and in notifying the owner of a slaughter-house not to slaughter any animal in this municipality without the assent of the Local Board of Health. The Board have not appointed a Medical Health Officer. There have been 15 cases of Scarlet Fever, 46 of Diphtheria, and two of Typhoid Fever in the village during the year ; but there are no precautions taken in regard to isolation, disinfection, etc., etc., nor do I know to what extent diseases might be reduced if those precautions were complied with.

E. R. WITHERIL,
Secretary.

NORTHUMBERLAND AND DURHAM.

Newcastle Village.

SECRETARY'S REPORT.

The officers of the Local Board of Health of this village did, in the month of August last, make a general inspection of the municipality, and in all cases when premises were not found in a sanitary condition, the officers ordered the cleansing of the same, which orders were cordially complied with. The health of the village is good at present.

GEORGE CURTIS,
Secretary.

CARLETON.

New Edinburgh Village.

SECRETARY'S REPORT.

I laid your communication before the Board of Health.

I am requested to state that in 1883, we engaged a Health Inspector to make a house to house visit. He was re-engaged in the spring of this year to do his best to look into the inner recesses of hidden filth, and as he is an "outsider" in official costume, we have every reason to believe he did his work well. We paid him $50, and he is paid extra if any neighbour reports the existence of a nuisance. We spent $6,000

last year in drainage, and this is now supposed to be the best drained village in the Province.

The Board had no report to make, but authorized me to state what had been done, and that every precaution is being taken to keep the surroundings as cleanly as possible.

T. TUBMAN,
Secretary.

WATERLOO.

Village of New Hamburg.

MEDICAL HEALTH OFFICER'S REPORT.

As Medical Health Officer, under and in accordance with *The Public Health Act of 1884*, I beg leave to Report as follows: That the Health Inspector has carefully inspected all premises in the corporation, and from personal consultation am pleased to report that he finds a marked improvement in cleanliness, and a spirit of improvement among the inhabitants when compared with past years. Still we are far from being perfect, and looking over his report I find many exceptions to privies, cellars, cesspools, and pig-sties, etc. He assures me, and I find from personal inspection and enquiries that even here where they have been pointed out, in most cases things have improved. So that as we proceed in future years with a stringent law and careful inspection, much disease and indisposition will be avoided. We have every reason in our village to be exact in carrying out the law. Situated on a peninsula almost surrounded by the river, we will always be under the influence of stagnant water, through the effluvia arising therefrom; added to this the fact that most of the wells are only from 12 to 25 feet in depth, and in many cases, if not all, very likely fed from the river, renders a thorough inspection of not only all general nuisances already mentioned, but especially of the wells in the place, as no doubt much of the endemic diseases are transmitted through the water we drink. In these cases we have recommended not only cleaning out the wells once or twice a year, but in addition to be pumped out once or twice a month at least, and during the heated term the water be boiled for drinking purposes. Tests of the well-water have been made by me, taken from various water of the village, and found generally unsatisfactory, rendering the above precaution very necessary.

Upon the whole the village during the past year has been very healthy, with a type of Malarial Fever with Typhoid symptoms in some cases, which has been prevalent during the past five months, but is now gradually disappearing. All of this could be ascribed to the stagnant river and impure well-water.

I think the programme of inspection, as issued by printed form here used, has been well carried out, and much praise is due to the Inspector for his thoroughness in what must always be a rather unpleasant job.

G. SCHMIDT,
Medical Health Officer.

WELLAND.

Niagara Falls Village.

CHAIRMAN'S REPORT.

I have been instructed by the Local Board of Health for this municipality to send you the following as the Report for 1884:—

A good work has been done here in improving the sanitary condition of the village. Under instructions of the Board the Sanitary Inspector has made a thorough inspection of nearly all the premises on every street, and in some cases he has made a second visit,

to see that proper cleaning up and disinfecting had been done according to requirement. All slaughter-houses have been moved to a proper distance from the village, and all other nuisances, so far as known, have been removed, so that the village is now in a fairly sanitary condition. I enclose herewith the Medical Health Officer's Report, as required by sec. 1 of Schedule A of *The Public Health Act of 1884.*

JOHN A. ORCHARD,
Chairman.

MEDICAL HEALTH OFFICER'S REPORT.

I have the honour to report that during the past year the health of this municipality has been excellent. With the exception of a few cases of Diphtheria, of a mild type, we have been entirely free from contagious or Zymotic diseases.

JAMES McGARRY, M.D.,
Medical Health Officer.

YORK.

Parkdale Village.

SECRETARY'S REPORT.

I have the honour to present herewith the second Annual Report of the Local Board of Health.

During the past year there have been reported to the Board but few cases of contagious diseases, and their prompt isolation has rendered the risk of spreading comparatively light—Typhoid fever especially has been much below the average, and in the greater proportion of the cases that have occurred, the disease has been traceable to sources lying outside of the municipality.

Of all matters pertaining to sanitary reform, as affecting the general health, that of drainage is of paramount importance. The fact of building a sewer along the street is not all that is comprised in the term drainage; but the connection of all houses on such a street with the sewer is necessary to complete the term in its fullest sense, and should that not be done, then the good effected by the municipal authorities is but half done, when it lacks the appreciation of the owners of household property, and the Board would respectfully recommend the Council to take such steps as may be necessary to compel the owners of property to connect with the sewers wherever they exist.

With reference to the exhalations from defective traps along the line of sewerage already constructed, the Board would recommend that an inspection be made at stated periods, say monthly, and that the Inspector be required to submit a report thereon to the Council.

With reference to the flushing of the sewers, although they have been flushed four times during the year, yet in the opinion of this Board, that is insufficient; and that this important matter should be also attended to at stated periods of every two months at least, or oftener if necessary, and that the Inspector be required to report thereon to the Council.

Another matter of importance is,—the bestowal of garbage. Hitherto the garbage collected by the scavenger has been placed upon low-lying lots, and as this is but causing an accumulation of decomposing matter, and so aggravating a nuisance instead of remedying it, and cannot but be prejudicial to the general health of the municipality, the Board would therefore most strongly urge upon the Council the adoption of the advice tendered by Dr. Covernton, of the Provincial Board of Health, upon this subject, namely, that it be disposed of by fire. A furnace suitable for the purpose could be built for a trifling outlay, when the great general benefit to be derived therefrom is considered.

In regard to the system of dry-earth closets, as recommended by the Provincial Board of Health, it has been adopted in numerous cases, but the cleaning out and disinfecting process has not been attended to with the punctuality necessary to health—indeed, the Medical Health Officer, Dr. Rowe, in his Report, states, "That he has no hesitation in saying that to such a source may be attributed numerous cases of sickness." The Board would therefore urge the necessity of enforcing the law in this important matter. In connection with this subject, the Board, this year, instituted a system of house to house visitation, for the purpose of remedying this very defect; but owing to the numerous duties of the Inspector in his dual position of Inspector of Works and Sanitary Inspector, he has been unable to systematically encompass the whole village—quite a large portion remaining unvisited. If the Council do not deem it expedient at present to appoint an Inspector whose whole time shall be devoted to the duties of such office, then the present Board would most strongly urge upon the new Board of Health for the year 1885, the urgent necessity of such an appointment being made.

From the manner in which the property-holders in many instances have thrown out their garbage and refuse on to the public lanes of the village, and causing thereby much loss of time to the scavenger and his team, the Board would also suggest that, if possible, for the next year, one of the street labourers should be detailed the day previous to the visit of the scavenger, to gather together all such scattered refuse in order that it may be more readily removed.

HENRY S. LANGTON,
Secretary.

MIDDLESEX.

Parkhill.

SANITARY INSPECTOR'S REPORT.

We have a Local Board actively engaged in matters relating to the public health; general cleanliness has engaged its attention the last year. Pits are the usual method of disposing of excreta; thirty-five of those said to be cleaned this year, forty-five not. No by-law regarding such pits until this year. Many of them are not over from twenty to sixty feet from the wells. No cases of diseases have been traced to their presence; where new ones are being built, dry earth closets have been recommended. Slop-water is mostly thrown on the earth; refuse of vegetables, etc., where no pigs or fowls are kept, is often thrown in back yards. Water supply, from wells from ten to twenty feet, which must contain surface water, as the soil is clay, and as two wells are often found on one-fifth of an acre, they must be more or less affected by the excreta and other refuse; only half of them contain water fit to drink. No nuisances, such as neglected slaughter-houses, etc., allowed inside the limits of the corporation. In our inspection we found some places that must in a few years become badly diseased; for instance, where two families live on one-fifth of an acre and have two wells and two cess-pits, which, when the latter overflow, the building is changed to another place on this narrow space of land. We would strongly recommend the dry-earth system. Even when the wells are bricked up, filth is always accumulating in the porous part of the brick. In only one instance did we find an excess of number in a tenant house, and then we found a family of nine, occupying two rooms 10 x 12. The most of the cellars are boarded up, and in a state of decay, but generally kept clean from vegetable matter. We would recommend that all Boards of Health have rules and regulations printed in pamphlet form, and furnished to the Sanitary Inspector to be handed to every householder, keeper of hotel, livery, or slaughter-house, so that they might know what was expected of them and be made to perform the necessary cleansing duties, for not one in a thousand have the least idea of the liabilities under which they are laid.

E. G. CHAMBERLAIN,
Sanitary Inspector.

WELLAND.

Port Colborne.

SECRETARY'S REPORT.

I beg leave to submit the following annual report of the sanitary work done during the year, and of the sanitary condition of the village:

Number of cesspools filled up and cleansed	1
Number of pig-pens cleansed and deodorized	6
Number of privies, soil removed, deodorized, etc.	15
Number of manure piles removed	4
Number of permissions in writing to milk vendors	2
Number of permissions to slaughter	1
Number of bakeries examined and found in good condition, clean, etc.	1

The present sanitary condition of the village is good, but when I, as Inspector, will have completed my rounds of inspection I expect that the condition generally will be better. I have met with no opposition as yet in the performance of my duty, but on the contrary all seem to act at once on notice being given.

S. J. HOPKINS,
Secretary and Inspector L. B. H.

LINCOLN.

Port Dalhousie Village.

MEDICAL HEALTH OFFICER'S REPORT.

As Medical Health Officer and Sanitary Inspector, I beg leave to submit the following report for year 1884. In unison with Chairman of your Board and the Reeve of the Municipality, we made in the early part of the spring a thorough inspection from house to house, and found things in a very satisfactory condition. With a desire on the part of the inhabitants to use every means suggested to them to carry out every precaution towards counteracting the poisonous effect of Malaria, sulphate of iron was procured and used freely as a disinfectant. I also procured vaccine virus and vaccinated successfully 185 children, thereby protecting the inhabitants from the ravages of Small-pox, which may at any time appear, and is now committing sad ravages in other parts of our country. I would say, gentlemen, that we have been blessed with a freedom from almost all malarial or contagious diseases; the only cases of a malarial nature were a few isolated of ague. I would respectfully advise upon your Board the urgent necessity of requesting the Council of this municipality to carry out the by-law prohibiting all persons from keeping slaughter-houses within the limits of the municipality, and also that hog-pens must be a certain limit from dwelling-houses, as the Provincial Board of Health directs. Those views meeting your approval, we may, with the help of divine Providence, be enabled to ward off contagion during the coming year.

JOHN WYSE CONSIDINE, M.D.

FRONTENAC.

Portsmouth Village.

CHAIRMAN AND SECRETARY'S REPORT.

We have the honour to report as follows: That the first meeting of the Board of Health of this village for 1884 was held on the 16th day of June last, at 12 o'clock noon. After the Board being duly organized, the Secretary was directed to prepare and post up

printed notices directing owners and occupants of premises to have their yards, cellars, out-buildings, privy-vaults, pits, etc., cleansed from all filth, dirt, nuisance, etc., before the first day of July, 1884 ; also that all wells, from which drinking water is used, be cleaned out by the same date.

Henry Knight (village constable) was appointed Sanitary Inspector, and ordered to make a general inspection of the village not later than the 15th day of July, and also that he make a written report of the same to the Chairman of the Board.

The second meeting of the Board was held on the 16th September—all members being present. With reference to the report of the Sanitary Inspector, which was presented and read, it was

Resolved: That the portion of the report relating to privies be adopted, and that he be instructed to notify persons whose privies are in an unsanitary condition, or discharge into open drains, or creeks or drains leading into creek, to be cleansed, or when required to be removed and reconstructed within ten days, and in the event of default the Sanitary Inspector be authorized to lay information against them, and compel compliance, as specified by the Act. That so far as the report on wells and water supply is concerned, the Inspector shall, as far as possible, see that the wells are properly cleaned and purified.

It was also recommended that the reconstruction of all water-closets be made as set forth in the pamphlet of the Provincial Board.

The attention of the Corporation was directed to the cleaning of the public well.

Pursuant to the call of the Chairman, the third meeting of the Board took place on the 16th October. The Board having, as a body, made a personal examination of the village creek and drains, also sundry water-closets, wells, etc., it was

Resolved: That the attention of the Council of Portsmouth be directed to the main village drain, and the creek running into it, with a view, if possible, of cleaning out the same and flushing it.

It was unanimously resolved that Dr. John H. Betts be appointed temporary Medical Health Officer. The Doctor being present stated that several mild cases of Diphtheria had made their appearance in the village, notably one case which proved fatal.

It was resolved that the Boards of Trustees of the Public and Separate Schools be requested to close the schools under their respective supervision for a period of one week from date, in view of the general state of sickness in the village ; and that the teachers be instructed to point out to the children the danger of mixing with the families of those affected.

The above is a brief epitome of the business of the Board for the present year.

We are happy to state that the above-named epidemic has apparently subsided, four deaths having occurred in a total of about eighteen cases, as far as we are able to learn. We trust it will have the effect of stirring up the people to a more personal and lively interest in the preservation of the public health.

It is to be regretted that the Council of this village has been so apathetic and inactive for several years past, thus placing an extra burden on the labours of the present year, the results of which have not been so satisfactory as were anticipated ; but it is earnestly hoped that the successors of the present Board will follow up the work already begun, with that energy and vigilance which the necessity and responsibility of the matter demand.

JAMES ADAMS, Chairman.
THOS. KELLY, Secretary.

YORK.

Richmond Hill Village.

SECRETARY'S REPORT.

At a meeting of the Local Board of Health of this village on the 19th November instant, the following resolution was passed, viz. :—

Moved by Mr. Brown, seconded by Mr. Falconbridge: That the Secretary is hereby instructed to report to the Provincial Board of Health that in the opinion of this Board, the sanitary state of the Village of Richmond Hill is in a reasonably satisfactory state at present, and that this Board will use its best endeavour to carry out the law relating to the public health, as circumstances may require.

M. TEEFY,
Secretary.

Stouffville Village.

CHAIRMAN'S REPORT.

As Chairman of the Board of Health, I beg to submit the following report:—

Since the 1st of May last (the time of our organization) we have held six monthly meetings; during that time there have been two thorough inspections of the village made, special attention being given to stagnant water, slaughter-houses, cesspools, and foul wells and cellars. Our Medical Health Officer (Dr. I. A. Freel) and our Inspector (James O'Brien) have both attended to their respective duties in a manner satisfactory to the Board. Particular attention has been paid to the condition of privy-vaults, yet there remains room for still further improvement in that direction.

Our village has been comparatively free from contagious diseases during the past six months. One case of Typhoid has been reported, but by the use of disinfectants and other necessary precautions the further spread of the disease was prevented.

I believe we have great reason to congratulate ourselves on the healthy condition of our village in general, and we shall no doubt in the future derive quite as much benefit from the precautions taken as we have done during this summer.

JAMES DOUGHERTY,
Chairman.

PEEL.

Village of Streetsville.

SECRETARY'S REPORT.

I have the honour to transmit to you the following report of the sanitary work done during the year, and of the sanitary condition of this municipality:—

The Local Board of Health was organized on Monday, the 19th day of May, when the first meeting of the Board was held, and Mr. William Taylor was appointed Chairman. Eight meetings of the Board have been held altogether. The object of the business done by the Board has been to cause to be made from time to time inspection of the municipality as needed, in order to force the removal of any unsanitary condition, or the abatement of any nuisance prejudicial to public health that might be found to exist in the municipality.

No Medical Health Officer has been appointed; but, on the recommendation of the Local Board, the Municipal Council appointed a Sanitary Inspector. Under the directions of the Local Board the Sanitary Inspector has made two regular house to house inspections of the whole municipality. Two, and in some cases three or more, additional visitations have been made to premises where unsanitary conditions or nuisances were found in the course of the regular inspection, in order to ensure their removal or abatement.

No cases of disease have been traced to the presence of privy-pits, but they have received attention according to the Act.

No instances are known of wells being affected by excreta or other refuse, or of streams or rivers.

The water supply is not affected by privy-pits, so far as known, nor by soil pollution, except in the case of two wells situated near the burial ground in the middle of the village.

No cases have been observed in this municipality of Small-pox, Scarlet fever, Measles, or Diphtheria; there has been one case of Whooping-cough, and no case of Typhoid fever.

There is one established slaughter-house within the municipality. The Sanitary Inspector has examined the premises ten times (he reports), and has, when necessary, caused the same to be cleansed and disinfected. The principal nuisance and danger to public health are due to a pig-pen connected with the slaughter-house. An attempt has been made to establish a second slaughter-house under conditions which are in violation of provisions of *The Public Health Act*, 1884; but the Local Board has called the attention of the occupant of the premises to the provisions of the law, and directed the Sanitary Inspector to prosecute for infraction thereof.

The attention of the Local Board has been given to the existence of the already overcrowded burial ground in the middle of the village, and a committee has been appointed to report in regard to the same, and a correspondence opened with the Provincial Board on the subject.

The unsanitary conditions and nuisances found in the village have been chiefly in the cases of neglected privies and pig-pens. A few manure heaps were found, which needed removal. Cellars were generally found well drained and in a clean condition, but in a few instances they were imperfectly drained, or their floors were composed of rotten planks. The removal of such unsanitary conditions was ordered by the Inspector in each case, and his attention given to the matter till his orders were complied with.

The houses in this village are, except in two or three instances, built on stone foundations.

The school premises, as well as the railway station in the village, have been regularly examined by the Inspector, and orders given to secure their being kept in a proper sanitary condition.

WM. J. PINNEY,
Secretary.

LAMBTON.

Thedford Village.

CHAIRMAN'S REPORT.

Our Board was legally constituted and established according to statute at the first meeting of our Council in May last, when a by-law to that effect was passed, appointing Drs. Munns and Cornell, and Thomas Lennox, Esq., as officers—who, together with the Reeve and Clerk, constitute a full Board. I have duly and regularly occupied my seat as chairman at each sitting—being in all eight meetings, including a preliminary one early in May, and on the 4th of August last, the Council under by-law, appointed Mr. Silvanus Cornell as Sanitary Inspector, and on the 24th of last month Dr. Warner Cornell was appointed Health Officer, *pro tem.*

It affords me great pleasure to be able to state that our municipality has every reason to be extremely thankful for its present very good sanitary condition, especially when compared with many other municipalities in our highly favoured Province of Ontario, and this is, in some not inconsiderable measure, to be attributed to the very efficient and prompt measures adopted by your Local Health Board. Typhoid Fever of a very malignant type was brought into the village from the township, and but for our immediate and decisive action would probably have been attended and followed with the worst of consequences. Also, during the summer, Hooping Cough and Scarlet Fever prevailed rather extensively, but in no instance with fatal results. We are unquestionably, in a sanitary respect, reaping great benefits from the action taken by the Council during the preceding year in tile-draining the village, as extensively as our money would permit, where such

drainage was most urgently required ; the natural and inevitable results of the severe drought of last summer being thereby considerably mitigated. We had also to confer with the Township Board of Health requesting them to look after a slaughter-house just outside our own limits, which, at the time had become, and was a terrible nuisance to the inhabitants of our village. After that the evil was very soon remedied, and we have heard no further complaint respecting it.

I must congratulate you on the very general cleanliness of the inhabitants of Thedford, and trust that in this matter I may always be able to do so. And I would request all householders intending to empty or fill up their privy-pits, to obtain proper information from any of the officers of our Local Board, and wherever it is practicable to replace the same with dry closets—plans of which any of the officers can furnish.

STEPHEN CORNELL,
Chairman.

MIDDLESEX.

Wardsville Village.

CHAIRMAN'S REPORT.

The Board did the work without an Inspector. So the report I shall give will have to suffice for that of a Sanitary Inspector.

We met four times and took a general inspection of the village. The place is so well situated and watered that we have very little trouble with disease. Was compelled to notify some parties before the nuisance was removed, but met with no resistance. There has been but very little disease in the place.

E. T. DUFTON,
Chairman.

WENTWORTH.

Waterdown Village.

MEDICAL HEALTH OFFICER'S REPORT.

It is my pleasing duty to report to you that during the past year our pleasant little Mountain Village has been exempt from any wide-spread outbreak of disease of an epidemic nature. It is true that we have been visited with some diseases of an infectious character, but they have been isolated cases and consequently endemic ; and from the fact that our village is very favourably situated on the summit of this ledge of mountain, with a large ravine dividing it into two parts, and said ravine being the source of a never-failing stream, thereby acting as a natural sewer to the village, and from the fact that we have but little stagnant water, I attribute in a great measure the health we enjoy.

While we are thankful for these natural advantages, we ought not to close our eyes and cry "safe," for in the past we have been visited with diseases of an epidemic nature that have spread from home to home that might have (in a measure) been avoided, had we not been ignorant of ways and means ; and the day may come when we shall have a like visitation in future. Nature in many instances requires assistance.

Let me point out to you something that might be done in this village for the furtherance of public health :

1. If not force, educate the people to have their privies properly disinfected once a week, or once a month at least : especially should you see to the one at our public school. The cost would be a mere nothing in comparison to the good it would accomplish.

2. Make it compulsory that all garbage, offal, manure, etc., from dwellings be disposed of once a month at least, where the Board see that it is necessary.

3. See that all cases of an epidemic nature be reported to you at once by the attending physician, so that you may take the proper steps to prevent the spread of the same.

4. Make it compulsory that all such cases present a physician's certificate before admitted back to school.

These four instances I have given you, I think should be carried out, and if it was so, it would be the means of preventing one-half of the sickness of any municipality.

During the past year, I have had under my care the following cases in this municipality :—Scarlet Fever, five cases ; Diphtheria, 19 cases ; Whooping-Cough, 2 cases ; Enteric Fever, 1 case.

J. A. McGREGOR, M.D.
Medical Health Officer.

BRUCE.

Wyarton Village.

SECRETARY'S REPORT.

The Board has made a thorough inspection of all premises four times during the hot weather. No infectious diseases have occurred in the village during the year. Slaughter-houses are kept in a clean condition during all seasons.

T. D. GALLOWAY,
Secretary.

TOWNSHIPS.

MIDDLESEX.

Adelaide Township.

SECRETARY'S REPORT.

The Secretary of the Board in compliance with the requirements of the Act, 1884, begs to report as follows :

That the Municipal Council of the Township of Adelaide, at its meeting in May, appointed three members, namely, Messrs. Russell B. Smith, Wm. Chapman, and Samuel Foster ; Duncan A. Campbell, Reeve, as Chairman ; Wm. Miller, Clerk and Secretary ; Walter W. Hoare, M.D., compose said Board. No Health Inspector has been appointed as yet, but the physician, chairman, and all the members of the Board, are vigilant in looking after the sanitary condition of the township.

There have been no contagious or infectious diseases during the year, with the exception of Whooping-Cough among the children.

The Board feel that the public health of the township demands their best attention ; but feel that to comply at once with all the requirements of the Act, cannot be attained, unless the cheerful compliance of the people themselves be obtained.

WM. MILLER,
Secretary.

RENFREW.

Admaston Township.

SECRETARY'S REPORT.

The Local Board is not very active, no special object having engaged its attention during the year; nor has it appointed a Medical Health Officer or Sanitary Inspector. There is no by-law in force relating to privy pits, and where there is not the excreta is generally deposited with the manure of the yard. The water-supply, which is had from wells, springs, and creeks, is said to be excellent, and not polluted by outhouse contents or surface-water. Have not yet had cause to take steps regarding the erection of an isolation hospital, or the disinfection, etc., of persons, clothing or houses, no infectious disease having visited here. The township is healthy and in a good sanitary condition.

GEO. BERLANQUET,
Secretary.

LENNOX AND ADDINGTON.

Township of Adolphustown.

CHAIRMAN'S REPORT.

Since our organization we have devoted considerable attention to the practice of cleanliness and otherwise with the residents of this township, and have found none but have been kept in good sanitary condition, so far as our observations have gone.

There has been no sickness in the township for the last six months, except from old age, or from long standing cases of consumption.

The Council appointed Dr. Young, Health Officer, and W. N. Mallory, Sanitary Inspector, but neither have furnished any report up to this time.

W. N. MALLORY,
Chairman.

BRUCE.

Albemarle Township.

CHAIRMAN'S REPORT.

I have the honour to present herewith the First Annual Report of the Local Board of Health for the Township of Albemarle:

This Board would respectfully urge upon the Council the importance of appointing a Medical Health Officer for this municipality.

Physicians, as a rule, are in a position to have their attention drawn much more frequently than any others have, to the bad sanitary condition of the people; and this Board is of the opinion that some arrangement might be made with one of the local physicians, at a nominal salary, to perform the duties of a Medical Health Officer; for we think it would add but little to his labour, as all that is required would be a note of his observations taken in his frequent calls through the township, and report the same to the Board, together with his suggestions.

Owing to no such appointment having been made in this township, the amount of information laid before the Board relative to the sanitary condition of the municipality has been much more limited than it would otherwise have been, and the object and actions

of the Board limited accordingly ; but we deem it a matter of congratulation that there has not been a single case of any contagious or infectious disease brought to the notice of this Board during the year, and, as far as ascertained, the public health of the township is in a very satisfactory condition.

Owing to the thinly settled state of this township, and it being naturally a very healthy locality, a Local Board of Health is not deemed a great necessity ; nevertheless, in the event of a breaking out of any epidemic and infectious disease, a Local Board of Health would no doubt perform valuable and efficient service.

ANDREW WEIR,
Chairman.

RENFREW.

Township of Alice.

SECRETARY'S REPORT.

It is a matter of thankfulness that during the present year the township has not been visited with any widespread cause of mortality or sickness beyond the ordinary causes, except some cases of Typhoid Fever, which were confined exclusively to one family, and the physician in attendance pronounced it not infectious, but gave it as his opinion that it originated from impure water or some other local cause. A committee of the Board made an inspection of the premises and well, and found it located in close proximity with the barnyard ; we also gave instructions to use no more of the water from the well, and advised it to be filled in. We have made an abstract of By-law annexed to the Public Health Act, and have caused a sufficient number to be printed and distributed to all the householders in the township. We have also supplied the several doctors practising in the township with forms, as contained in Rule 3 in said By-law, and also had a sufficient number of cards prepared and printed in accordance with Rule 4.

J. M. KENNEDY,
Secretary.

BRUCE.

Amabel Township.

CHAIRMAN'S REPORT.

Inspection was made of anything in the township calculated to be the engendering element of disease, and, when required, disinfectants were used. Township is in a very healthy condition.

A. B. TAYLOR, M.D.,
Chairman.

DUFFERIN.

Amaranth Township.

SECRETARY'S REPORT.

The Amaranth Council held a meeting on May 31st, and the Clerk notified them of their appointment, and forwarded to each member a copy of *The Public Health Act* ; but as yet no action has been taken by them, owing to the fact, I think, of the Act not providing any remuneration for their services, except at the discretion of the Council.

A practising physician was appointed as Medical Health Officer, at a meeting held on November 8th, but so far has not made any report of the sanitary condition of the township, in compliance with Sec. 1, Schedule "A," of the said Act. No salary was provided for his services.

No precautions are taken to prevent the spread of disease in this municipality, but there have been no contagious diseases that progressed to any great extent.

There were, during part of last winter and spring, a number of cases of Scarlet Fever, which spread for a short time and caused some alarm; but through medical skill the disease was checked before it had advanced to any great extent. Again, towards the fall of the year, Typhoid Fever was brought into the township by a visitor from the neighbourhood of Chatham, five cases arising therefrom, all of which recovered and the disease arrested. With these two exceptions no contagious diseases have existed except those pertaining to children, such as Whooping-Cough, etc.

MATTHEW G. VARCOE,
Secretary.

WENTWORTH.

Township of Ancaster.

CHAIRMAN'S REPORT.

The local Board of Health of the Township of Ancaster, in presenting their annual report on the sanitary condition of the municipality of the Township, beg leave to say that they adopted the course and acted upon the questions bearing upon the sanitary work of the Local Board, and the condition of the municipality.

The removal of nuisances, such as the carcasses of dead animals, the pollution of streams, and the cleansing of slaughter-houses, glue and bone-dust factories, have been attended to. Two privies have been removed, because of their dangerous proximity to wells, and erected at a safe distance.

There have been six or seven cases of Diphtheria and seven or eight cases of Typhoid, supposed to be propagated by the filth in a pond near the dwellings.

There are several nuisances in existence yet, which will require looking after.

The Local Board would further report that, from the returns of deaths reported to the Division Registrar, the general health of the Municipality compares favourably with the preceding year; and that, of 54 deaths registered for the present year, only two are reported from contagious diseases, viz., Typhoid Fever.

T. A. WALKER,
Chairman.

LEEDS AND GRENVILLE.

Augusta Township.

SECRETARY'S REPORT.

Your letter of 21st October was laid before the Chairman of our Local Board of Health, but as no Medical Health Officer has been appointed, and we have had no epidemic or infectious diseases prevailing in this Township, no sanitary work has been done, consequently the Chairman thought it unnecessary to call another meeting of the Board.

M. MYLKS.
Secretary.

WENTWORTH.

Barton Township.

SECRETARY'S REPORT.

In compliance with the provisions of *The Public Health Act*, I beg leave to make the following report:—

We have a Local Board actively engaged, and have made examinations of all slaughter-houses in the municipality, and in some cases have found them kept in good order, in other cases have found them not in good condition, but was everywhere met with a willingness to comply with the recommendation of the Board. Have also examined a number of private properties, and in some cases found them in a very filthy condition. In one case no less than six water-closets were placed over an open drain, and the filth in them causing such a stench that it was quite unbearable, the Board at once ordered the removal of the water-closets, as they were within a few feet of the dwellings. The delivery of night-soil from the City of Hamilton has given the Board perhaps more trouble than anything else, as a number of persons are anxious to procure it for manure. They were allowed to have it brought to their premises, they to disinfect it, which in most cases was done. Two or three parties would not comply with our instructions, and they were ordered to quit, which they did not do; and as they persisted in disobeying our instructions they were brought before the Police Magistrate and fined five dollars each, which had a good effect, not on them alone, but on others too.

We have not any Medical Health Officer.

There have been a very small number of cases of infectious diseases reported. There are no particular precautions taken in regard to isolation, but great care is taken in regard to disinfecting houses, clothing, etc.

The children do not have to present a medical certificate before re-admission to schools, in cases where contagious diseases have existed in the family.

ROBERT D. BENSLEY,
Secretary.

CHAIRMAN'S REPORT.

As Chairman of the Board of Health for the Township of Barton, I beg leave to submit the following report for the year 1884:—We visited all the slaughter-houses in the north and south part of the township, the Ontario pork factory, and Mr. Rowlin's gut factory. We found most of the places in as clean a condition as could be reasonably expected. Where we considered an improvement could be made, we suggested a liberal use of carbolic acid and lime, and revisited to see that our suggestions were carried out; and I am pleased to say nearly all parties acted upon our advice. We had to prosecute three parties for depositing night-soil and leaving the same exposed; we tried our best to avoid this unpleasant course, but our persuasive powers failing, we had to take more stringent measures. The total expenses of the Board for the year are sixty-eight dollars. Trusting this report of our work will be approved of by your honourable body, etc.

HARRY BRYANT,
Chairman.

WELLAND.

Bertie Township.

CHAIRMAN'S REPORT.

The undersigned, being Chairman of the Local Board of Health for the Township of Bertie, begs leave to report for the information of your honourable body, as follows:—

The Board of Health organized according to statute on the 26th day of May, 1884.

Several complaints were received during the year, and by order of the Board the Sanitary Inspectors were authorized to inspect the premises and report to the Board; they were also instructed to make a general inspection of the township, which they performed, and reported results to the Board.

No contagious or infectious diseases were reported to the Board during the year.

I am of the opinion that the sanitary condition of the township at this date is good.

Several of the nuisances complained of were abated after an inspection by the Sanitary Inspectors.

C. RISELAY,
Chairman.

MEDICAL HEALTH OFFICER'S REPORT.

In submitting this my first report, I have pleasure in stating my duties have been very light. No case of contagious disease, or other matter requiring my attention, has been officially reported; but having knowledge that a mild form of Scarlet Fever had been lurking in the western part of the township for nearly two years, and that it was gradually working eastward, and fearing it might assume a more virulent form, I endeavoured to have it stamped out, and to that end conferred with the Trustees of School Section No. 10, where an outbreak had occurred; and using due precaution in the case of Mr. W. W. Bowen's family, then down with it, we were happily enabled to prevent its further spread. And to my knowledge there has been no case of any contagious disease within this municipality since July until now, as I am informed, though unofficially. There have recently been two cases, ending in death, in the family of Robert Clough, under the care of Dr. Douglass, and I have written him concerning the matter, urging every precaution to prevent its spread, and offering any assistance in my power. I find a disposition among the people to ignore the provisions of the Health Bill, but I trust that a better knowledge and more mature consideration of its merits, will lead to a general acceptance of it as a good measure, and so prevent a lamentable waste of human life.

N. BREWSTER, M.D.,
Medical Health Officer.

WENTWORTH.

Township of Beverley.

SECRETARY'S REPORT.

The sanitary work done in this municipality during the year is nothing. I received a book from the department in Toronto for the Inspector to enter his notes when making his inspection. I offered the book to the Inspector; he said he had not been called upon in the way of requiring to use the book, and he did not take it. He has not called for it yet, I presume for the same reason.

The township as a whole, so far as I know, has been about as healthy as usual. The number of deaths for the current year will, I think, exceed the average. Up to this date over seventy have been reported to me as registered. I can't say that the extra number is caused by any particular disease, but I find the number of deaths of persons of the age of 70 and over to be greater than usual. The number reported to me between 70 and 80 is fifteen; between 80 and 90, seven; and between 90 and 100, two.

In many of the wells in this township the water is obtained by drilling into the rock. The water from such wells and the springs is generally pure.

There is a large cedar swamp in the north part of the township of many hundreds of acres, that in the spring of the year, or in case of a freshet, is covered with water; but it is not considered that the health of the people living near it is affected thereby.

In conclusion I have only to say, that although the work done by the Board for the present year has been but slight, and it may be said by some that the Board of Health is unnecessary and an expense for nothing; but should the municipality or any part thereof be visited by an epidemic, the machinery will be ready to be put in motion to prevent the spread of the disease.

W. McDONALD,
Secretary.

MEDICAL HEALTH OFFICER'S REPORT.

I beg to report that I was appointed Medical Health Officer to your Board on the 9th of June, 1884.

That since that time some cases of Diphtheria and Scarlet Fever have come under my care, and one death occurred as the result of Scarlet Fever. Precautionary measures were at once enforced, and the diseases soon stamped out.

No reports of contagious diseases have reached me from medical men who practice in the township, nor have any complaints been made by individuals, so I am able to report favourably upon the state of public health in the township.

J. W. SMITH, M. B.,
Medical Health Officer.

PERTH.

Township of Blanshard.

SECRETARY'S REPORT.

I may state that our Local Board of Health has done very little, for the simple reason of nothing coming under their notice. We met three times and inspected one cheese factory, one creamery or butter factory, and one school, and found them neat and clean, with the exception of the water-closets and well of the school-house, which have since been thoroughly renovated. No other cases have come under our notice. The water-supply is mostly good spring wells—is not affected by any filth. Our township is mostly high, dry land, and is pretty thoroughly drained, so that there is very little stagnant water, if any. Only one case of disease of a contagious nature came under our notice, a little girl who died of Typhoid fever; she was attended by our Medical Health Officer, viz., Dr. Irving, of Kirkton. We have no Sanitary Inspector, and the Board is looked upon by the people as a bill of expense in our township, but is considered a capital thing for cities, towns, and villages. I cannot give you any fuller report than what is contained in this note. Hoping it will be satisfactory, I remain yours respectfully,

S. CLARKE,
Secretary.

OXFORD.

Blandford Township.

SECRETARY'S REPORT.

In accordance with the provisions of *The Public Health Act*, 1884, the Board of Health for the Township of Blandford beg to report as follows:—

At a meeting of Council of this township held on 28th May, a by-law, amending the by-law appended to *The Public Health Act*, was passed; but as the sanitary condition of

the municipality was quite satisfactory, it was not deemed necessary to appoint a Health Officer or Inspector.

Only one complaint of nuisance was made since the organisation of the Local Board; the offender, a butcher in the vicinity of the Town of Woodstock, was promptly notified to clean up his yard, and we have reason to believe that he acted in accordance with our instructions, as no further complaints were lodged.

No notice, as provided by section 46, has been given to this Board of the prevalence of any infectious diseases, although one case of Small-pox recently occurred in the township—the patient having contracted the disease in Brantford. Fortunately, owing to the comparatively isolated position of the family, and the precautions of the medical attendant, no further cases occurred.

J. SMITH, Jr.,
Secretary.

WENTWORTH.

Binbrook Township.

CHAIRMAN'S REPORT.

Taking into consideration the clean and healthy state of the township, we thought it unnecessary to appoint a Medical Health Officer or Sanitary Inspector. Our attention has been called to only one case of nuisance, that of a slaughter-house in the Village of Hall's Corner, which has been removed to the satisfaction of the inhabitants, and after making diligent enquiry, we find the township in a clean and healthy condition. But in view of the danger of that awful scourge (the Cholera) visiting our country next year, we would recommend that the Council appoint a Medical Health Officer and Sanitary Inspector, and that the law be enforced not only to prevent disease, but to have all cases of infectious and contagious diseases properly isolated. We trust that the inhabitants of Binbrook, in view of the danger of an epidemic, will do all in their power to assist the Board in carrying out the law for their own safety, as well as the safety of the public in general.

W. G. FLETCHER,
Chairman.

LAMBTON.

Township of Bosanquet.

SECRETARY'S REPORT.

The Council of the Township of Bosanquet, in accordance with the requirements of the *Public Health Act*, did appoint a Local Board of Health for said township.

Your Board beg to report that the sanitary condition of the said township is satisfactory, and that no contagious disease has come to the knowledge of your Board during the last six months, with the exception of a few mild cases of Whooping-Cough and Measles.

The only complaint made to the Board since its organization was one in regard to the existence of a slaughter-house owned by a resident of the Village of Thedford, the said slaughter-house being situated in the Township of Bosanquet, in close proximity to the public highway and several private dwelling houses; your Board have decided to take the necessary steps for its removal.

We beg further to report that no Medical Health Officer has been appointed by the Municipal Council of Rosanquet, as the said Council and your Local Board of Health did not consider it necessary.

ADAM DUFFUS,
Secretary.

BRUCE.

Brant Township.

SECRETARY'S REPORT.

I have to report that the Local Board of Health was organized in accordance with *The Public Health Act.* Inspection has been made of various places where, if in an unsanitary state, disease might be the result, and when found in this state the proper remedies were applied. No contagious diseases have been reported, and to the best of my knowledge the township is in a good state, so far as health and sanitation are concerned.

JAS. S. LAURIE,
Secretary.

BRANT.

Brantford Township.

MEDICAL HEALTH OFFICER'S REPORT.

Owing to the short period of time that has elapsed since the organization of this Board of Health, it is impossible for me to submit to you anything but a meagre and incomplete report. I beg, therefore, to lay before you a short statement of what has been done, and my experience and impressions since its organization. There have been so far, I think, but two complaints made to this Board, and in each case prompt action was taken to remove or abate the nuisance complained of. The first was the fertilizing establishment north-east of the city, where the night-soil from Brantford is carted and manufactured into a valuable land fertilizer. This place was visited by all the members of this Board, and although some time has elapsed the business has only lately been finally stopped. I think now, however, the establishment is closed for good, and another place at a proper distance from any dwelling will have to be procured before the business will be allowed to go on.

The second complaint was from West Brantford, from a very disagreeable smell arising from two slaughter-houses in the Township of Brantford, adjacent to West Brantford. These houses were also visited by the full Board, and notice given to the owners to stop slaughtering and clean up the offal, etc., around the houses; and I also sent a notice myself to these gentlemen, owing to their tardiness in cleaning up the nuisance, and requesting the removal of both slaughter-houses to a legal distance from any dwelling or street, within a specified time. There are many other fruitful sources of disease in this township that I would strongly urge on every individual member of the Board to take into consideration, and endeavour as far as possible to have removed. Among these I might mention "surface accumulation of stagnant water," which is a fruitful source of malaria, and malaria is the cause of a large percentage of the prevalent diseases in our township. Steps should be taken to compel owners of lands where such conditions are present to open up drains for the escape of the waters, and if not able the Township Council should take the matter in hand. Public money when used in mitigating or removing sources of disease, is always well spent.

Another very important matter and one which should be instilled into the minds of every householder, is the proper method for the removal of excreta. The common privy-pit is one of the most common causes of Typhoid Fever. I have during my practice frequently traced the origin of this fatal disease to the pollution of the drinking water used by the family. The dry earth-closet, now coming into use, if adopted by every family, will certainly greatly abate this particular disease, and will be conducive to health in many other ways. I think one of those excellent dry earth-closets should be kept on exhibition in Brantford, with printed explanations posted on it, showing everyone how to use them, the cost, etc. This in my opinion would much more quickly bring them into

general use. I might also mention two more sources of disease which are very common in country places. One, that of allowing surface water to wash into wells, carrying with it all the filth that may be deposited around, as the excreta of animals and fowls, etc., loading the water drunk by the family with a deadly poison, both animal and vegetable. Water from a well may be clear and cool, and still be very impure. It is a mistake to suppose that when water filters through a few inches or feet of earth it is pure. In such water are often found the germs that produce Typhoid Fever, Bowel complaints, and other diseases. Wells should be raised several feet above the level of the ground with brick and mortar, and tightly closed in at the top to prevent any leakage into them from above. The second cause and the last I will mention in this report, is dampness in houses from defective drainage. It is a mistake to suppose that because there is no standing water in the cellar there is no dampness. The earth of the cellar floor may be saturated with water of the most filthy kind. I am certain that much sickness is produced by this cause. Many diseases of throat, lungs and bowels originate from this cause alone. There should be an open drain under every house that would purify at least two feet of earth at the bottom of every cellar, not only of water but also of impure air.

In order to carry these sanitary reforms into practice people will have to be educated as to the benefits to be derived from them, and then, if necessary, be compelled to carry them out in order to prevent the spread of disease. There are many other matters of information which might be mentioned, but this is enough to show the large field of sanitary reform before us. All of which is respectfully submitted.

D. MARQUISE,
Medical Health Officer.

CHAIRMAN'S REPORT.

As required by clause 3 of the Public Health by-law, I beg to submit herewith the first annual report of your Board of Health, containing a detailed statement of the work accomplished by the Board during the year, as follows:—

The Board held its first meeting on the 19th day of May, when a Chairman was appointed, and, there being no other business before it, the Board adjourned.

On the 16th day of August another meeting of the Board was convened by the Chairman, when the following complaints were laid before them, viz.:

1. From Mr. W. H. Yapp, complaining of a very disagreeable and offensive odour, occasioned by night-soil being dumped in an adjoining yard by a fertilizing company. Your Board after considerable difficulty caused the company to cease operations, thereby abating this nuisance.

The next complaint was that of one Joseph Elliott, in reference to the slaughter-houses of Messrs. Livingston and Sage, and, as in the previous case, after considerable difficulty, the Board succeeded in getting these nuisances abated.

Accompanying this report you have a very full and carefully prepared report of the Medical Health Officer on the sanitary condition of the municipality.

WILLIAM BIGGAR,
Chairman.

ONTARIO.

Township of Brock.

CHAIRMAN'S REPORT.

In presenting my report, I regret to say I am not able to speak from personal knowledge so clearly as I would wish to be able to do, being unavoidably absent the greater part of the summer.

But from the information received from our very efficient Sanitary Inspector, must congratulate you that in a general way the sanitary condition of our township may be called good. The Township of Brock being in the main high and rolling, yet there are large tracts of low-lying swamp lands which are yet undrained, and which are overflowed with water every spring, remaining until June before it is entirely gone, the decaying vegetable matter of which must emit a vast amount of malarial poison to be carried by the winds through the surrounding country.

In the southern part of the township the people are with commendable energy draining their swamp lands, having nearly completed a drain some six miles in length, which will not only increase the value of their land for agricultural purposes, but will be of invaluable benefit from a sanitary point of view.

The municipality ought to be devoutedly thankful to a kind Providence that our township has not been visited by any serious epidemic until the month of November, when Diphtheria made its appearance in two places.

The first occurred about the middle of November on Lot 5, in the 14th Concession, and according to information kindly furnished by Dr. Gillespie, the measures taken for disinfection were so good that the disease has spread no further.

The other occurred on Lot 12, Concession 3, of which they are yet suffering, two having died ; the other members, I am pleased to say, are, I believe, recovering under the skilful treatment of Dr. McDermott, and it will require the best efforts of the Board to keep it from spreading.

Our township being almost purely agricultural, and the majority of the farmers of that class who keep abreast of the times, no longer allow the manure to remain lying in their yards during the summer, but remove it to the field in early spring, and indeed, in many cases it is removed as fast as it accumulates.

While many cheerfully complied with the request of the Sanitary Inspector with regard to the removal of nuisances, cleaning of wells, cisterns, etc., a few have refused or neglected to comply, and I think it would be wisdom on the part of the Board to enforce the law.

I would also recommend the appointment of a Medical Health Officer as soon as possible, for I consider the Board is incomplete without such an officer, inasmuch as the Inspector, no matter how diligent, would be unable to detect evils that if checked in time might save the outbreak of some epidemic.

All of which is respectfully submitted.

R. CUNNINGHAM,
Chairman L.B.H.

LAMBTON.

Brooke Township.

SECRETARY'S REPORT.

The only complaint made to the Board came from the Local Board of Health of the village of Alvinston, and was relative to stagnant water in an obstructed stream just outside the village boundaries, and close to the principal part of the village. It appeared that formerly the Sydenham River divided into two streams on the east side of the village, and when the Canadian Southern Railway Company were building their road, one of those streams was filled up by an embankment a short distance from where the streams again united, thus leaving a portion of the stream above the railway into which the water ran without any means of exit. The Boards addressed a letter jointly to the Superintendent of the Company asking him to order the streams or channels to be connected, which request was complied with.

The Municipal Council have not appointed a Medical Health Officer nor a Sanitary Inspector, hence I have no such reports to embody in this.

Originally there was a large quantity of low and wet land in the township, but the

Township Council have expended a large sum in draining those lands, so that now nearly every side-road and concession is opened up and ditched. In some places where runways were not on roads ditches have been constructed in them, so that I may say we have no swamp land.

Ague and Malarial Fevers were not so common as in previous years. The general health of the people in the municipality is good, and I know of no nuisance to call forth the interference of the Board.

W. G. WILLOUGHBY,
Secretary.

BRANT.

Burford Township.

SECRETARY'S REPORT.

In reply to your circular I am instructed by the Reeve to say that no Inspector has yet been appointed for the Township of Burford, as no nuisance was reported or known to exist, except the feeding of hogs at two cheese factories. Their plans could not be very well changed in the middle of the summer, but will be before another season begins. I hope we may be in better shape next year. I recognize the necessity of an active Local Board of Health. The health of the municipality is, on an average, good.

ALBERT FOSTER.
Secretary.

PEEL.

Township of Caledon.

MEDICAL HEALTH OFFICER'S REPORT.

It affords me considerable pleasure to render this the first report to the first Board of Health established in Caledon : it is an evidence that we are keeping pace with the times, and that we are not falling behind the onward march of civilization. The preservation of life and health, and the sanitary laws governing the same bids fair to become the great science of the future. And when we think of the suffering and death caused by the neglect or ignorance of these laws, we must surely feel it our duty as men and as a Board to do all we can to promulgate a general knowledge of sanitary science, and to prevent as far as possible the origin and spread of disease dangerous to the public health. I regret to say that I am unable to furnish any full statistical report, or even an approximate one, of the whole municipality. This was a great disappointment to me, as it will no doubt be to you, but it is due to the fact that up to the present time none of my confreres practising in Caledon have as yet furnished me with a single report, as requested by Rule 1, section 17.

Shortly after our organization on the 9th of June, I mailed to every physician practising in the municipality blanks on which to report infectious diseases, and for reporting death or recovery from the same. Early in July, on receiving a communication from the Secretary of the Provincial Board regarding this matter, together with a request as to my so-called weekly statistical reports, I sent him a list of the physicians practising in Caledon, asking him to couple his request with mine regarding the sending of their reports to me ; but with the same discouraging results. My purpose then was to send a report of all cases occurring in my own practice, but as those reports would not be at all representative, I finally concluded to wait until a more satisfactory state of affairs could

be brought about. The indifference met with regarding these reports has no doubt prevented much useful work that might otherwise have been done, and very materially impeded our progress. It is in rural municipalities that this indifference is most keenly felt, for in incorporated towns and villages almost every case of infectious or contagious disease is within the cognizance of the Sanitary Inspector, or Medical Health Officer. However, I trust that the steps taken at our last meeting, together with the pressure of public opinion, will gradually remove this indifference, and that long before the next annual report is rendered, we may be receiving full statistics of the whole municipality, enabling us to do much good and useful work for our own municipality, and to assist the Provincial Board in the noble work they have undertaken.

Regarding the sanitary condition of the municipality, my remarks of course shall only be general, owing to the want of statistics on which to base my report. Our high mountainous position, the light dry nature of our soil, and the generally pure character of our water, give us almost an immunity from Typhoid and Malarial Fevers. I might except the lower or southern part of Caledon, below the mountain ridge, where Typhoid and Malarial Fevers are more prevalent, due to the low swampy nature of the locality; but this district includes only the smaller part of the township, and even here cultivation of this low land is fast removing these influences. If Caledon were compared with other townships throughout Ontario, I am satisfied that it would show a state of public health far above the average, but this, I think, is more due to our natural advantages than to a particularly good sanitary condition. Amongst the farming community generally the sanitary condition of their homes is very fair, but there is great room for improvement, the greatest difficulty in many instances is the pollution of their drinking water by soakage or drainage from the barn yards into their wells; in some cases the well is situated in the barn yard or near it, and in other cases, even althongh the well may be some distance away, it is situated on a lower level than the barn yard, thus necessarily producing a certain amount of drainage or soakage during wet or rainy seasons, and the pollution of otherwise pure water. I might say that all the cases of Typhoid Fever occurring in my own practice outside of the villages have been due to this or the like causes; very frequently the violence of other non-contagious diseases has been increased by the pollution of drinking water introducing that Typhoid or low element into other diseases, which is so often spoken of by physicians.

In the villages of the municipality, viz.: Alton, Charleston, Mono Mills, Caledon East, Cataract, Belfountain, and Credit Forks, the general sanitary condition is worse than in the more rural districts, due to the houses being more closely crowded together, and in many instances to uncleanliness; one evil of a general character is the damp and uncleanly nature of cellars; in many cases water finds its way into cellars in the spring, and remaining there for months afterwards pollutes the atmosphere of houses which might otherwise be pure—in other cases the remains of apples, potatoes, turnips, etc., which have rotted during the winter, are left from year to year. These two conditions have frequently in my own experience produced local outbreaks of Diphtheria, and I have doubted whether they have not sometimes induced Croup and Bronchitis. Another evil is the throwing of table refuse and slops of all kinds just outside of the door, particularly during winter, leaving the door yard a perfect cesspool in the spring when the snow thaws away.

Then, as a general rule, hog-pens remain uncleaned for months, even during the summer; and many of the privies are never cleaned at all. In Alton during the past few years I have noticed the deleterious influence of a large slaughter-house, up to the time of its removal in the summer of 1883. Five of the houses in the immediate neighbourhood of the slaughter-house used their drinking water principally out of the one well. Every spring the children living in these houses were subject more or less to Croup, Diphtheria, and Bronchitis, and out of these houses in three years there were three deaths from Croup, and one from Diphtheria, besides many other cases of Diphtheria which recovered. These cases always occurred when there were no other cases of the kind in the vicinity. I repeatedly urged the removal of the slaughter-house, during my residence in Alton, but it was not until a year ago last summer that it was removed. The result was that since its removal there has not been one case of Diphtheria or Croup, or any sickness of a

serious nature whatever. In the village of Cataract there have been recently five cases of Scarlet Fever of all degrees, from the mildest to the most violent form, and one of which proved fatal. There were not in the township any other cases of Scarlet Fever at this time, and I naturally began to look about to see what the sanitary conditions of these places were. I found the surroundings of the houses in which these cases were in a very bad condition, privy-sinks that have not been cleaned for years, broken down stables that have been used for hog-pens, and places for slaughtering hogs filled with manure and filth. I would not say that these conditions caused the outbreak, but I am satisfied they increased the virulence of the disease; may, perhaps, have localized the infection. I have ordered the removal of these nuisances, and I trust the order will soon be complied with.

I have pointed out these evils, gentlemen, to show you the work that is in store for us, and that even in this comparatively healthy township much remains undone. I might venture to say that I believe the easiest and the best way to remove these evils, is to educate the people. Teach them that these things are evils, and that they are dangerous to their own lives, and to the lives of those that are near and dear to them—then they will have both an object and a duty in the observance of sanitary laws.

I believe that in questions like these, education is as necessary as legislation, and that the two should go hand in hand. Much could be done by introducing lectures on the subject into our common schools. The youth should learn that physical education is as important as mental education—teach them that pure food, pure air, and pure water are essential to life and health.

I believe the Education Department have now recognized the importance of teaching Hygiene and Physiology in our public schools, and I believe that greater advancement can be made in this way than in any other.

In conclusion, gentlemen, let me say that I hope we will become a Board of Health in reality, as well as in name; and that each and every one of us will do all he can to further sanitary progress.

Trusting that the shortness of time which has elapsed since our organization, and the want of statistics, may excuse the inefficiency of this report.

JAMES ALGIE, M.D.

MIDDLESEX.

Township of Caradoc.

SECRETARY'S REPORT.

The sanitary condition of the township is very satisfactory.

A. M. McEVOY,
Secretary Local Board of Health.

NORTHUMBERLAND AND DURHAM.

Township of Cavan.

SECRETARY'S REPORT.

I might mention that the Council of the Municipality of the Township of Cavan, in the County of Durham, appointed a Local Board of Health for said municipality, in accordance with *The Public Health Act of 1884*—(the names and addresses of the parties comprising such Board I sent to your address immediately after their appointment). The

Board have not appointed a Medical Health Officer or Sanitary Inspector, as they do not think it necessary to do so, as the township is in an excellent sanitary condition.

GEO. SOOTHERAN,
Secretary.

CHAIRMAN'S REPORT.

The Statute calls for a report from the Chairman of each Board of Health. In compliance, I would say that the Local Board for the Municipality of the Township of Cavan, in the County of Durham, has had two meetings during the year 1884, which have been attended by all the Board excepting one at our last meeting. Our township is nearly all composed of high, dry rolling land, with fine swift-running streams through it, the water being first-class.

Our people are getting more enlightened in reference to diseases, and are strictly guarding against spreading any infectious disease. At our last meeting the Board thought it unnecessary to appoint a Medical Health Officer at present, in consideration of our municipality being in a good healthy condition. I trust our successors will look after any infectious diseases that may occur in our township.

I am certain you will agree with me that we have reason to be thankful to the Almighty for the healthy condition of the township at this season of the year.

JAS. McLEAN,
Chairman.

MUSKOKA AND PARRY SOUND.

Chapman Township.

CLERK'S REPORT..

The first meeting of the Local Board of Health for the Township of Chapman was held at the Village of Magnetawan, Nov. 29th, 1884. Present: Hugh Irwin, Donald Gordon, and T. G. Pearce.

It was moved and seconded, that Donald Gordon be appointed Sanitary Inspector.

The members of the Board present inspected the various premises in the village, and found the sanitary state of said premises to be very satisfactory, especially the hotels.

T. G. PEARCE,
Clerk.

PEEL.

Chinguacousy Township.

SECRETARY'S REPORT.

The annual report of the Chinguacousy Board of Health is necessarily brief, as it has only been organized six months, and it has not yet appointed either a Medical Health Officer or Sanitary Inspector, in consequence of the not unusual difficulty of selection in such cases. The Board has met thrice since its establishment, but has had little to occupy its attention beyond the removal of a few local nuisances, the sanitary condition of the municipality during the period referred to having been excellent.

SAMUEL GRAY, SR.,
Secretary.

NORTHUMBERLAND AND DURHAM.

Clarke Township.

SANITARY INSPECTOR'S REPORT.

In pursuance of a resolution passed at a meeting of the Local Board of Health, held on the 11th inst., at Orono, I beg to submit the following report: Having traversed that part of the Township of Clarke alloted to me for inspection, in nearly every direction, and having made diligent enquiry everywhere, I have not heard of a single case of contagious disease at present existing within the limits of my division of the township; and yet notwithstanding this agreeable fact, I have in too many instances observed great indifference respecting the sanitary requisites for the preservation of health. I found hog-pens within a few feet of dwelling houses; wells and water closets within a rod of one another. The majority of the school-house privies were in a neglected and filthy condition, of which fact I notified the trustees; house slops thrown continually in one spot to putrify and fester in the sun. Two slaughter-houses—one at Crooked Creek and the other at Newtonville—owing to their close proximity to dwelling-houses, will be regarded as a standing menace to public health unless they are speedily closed or proper disinfectants used, which, I fear, will not be the case. I noticed likewise that the refuse of a cider mill in the eastern part of one village, is thrown into the street, emitting an unpleasant odour. I notified the proprietor to discontinue the practice and to remove the deposit at once, which he promised to do. I gave warning to those persons whose premises were in a neglected condition to clean their wells, hog-pens, privies, etc., but whether they will heed the warning remains to be seen. In conclusion, I would just observe that the inspection given to my district was by no means as thorough as it might have been, owing to the shortness of the time devoted to that object; and, moreover, I fear that it will be a matter of much difficulty to enforce the law so as to compel even a partial observance of its provisions.

JOSEPH JACOBS,
Inspector.

STORMONT, DUNDAS AND GLENGARRY.

Township of Cornwall.

SECRETARY'S REPORT.

As Secretary of the Board of Health for this township, I have to state that this municipality is in a fair sanitary condition, excepting the small villages adjoining the town of Cornwall, and they have been kept in very fair order this year. But as our Board has not got into regular working order yet, I am unable to make a report, but I hope there will be more system in the coming year, and that there will be regular monthly meetings held during spring and summer months. We have got a medical man appointed as Health Officer, but not salaried, just paid for his time when he is employed, and in answer to the other questions, I would state as follows: 3, as found most convenient; 4, No. 6, No. 7, No. 8, as most convenient; 9, cleaned up every year; 10, No. 11, wells; 12, none; 13, No. 15, No. 16, d, six; f, one not reported; 18, nearly all; 19, No. 20, none; 21, none.

R. ANDERSON,
Secretary.

LEEDS AND GRENVILLE.

Crosby North Township.

CLERK'S REPORT.

Our Board was organized and held its first meeting on the 16th day of June, 1884. We have had in all five meetings, and appointed W. C. Fredenburgh Sanitary Inspector. Said inspector has visited, from time to time, all places where nuisances were reported to exist, and had such nuisances abated. Our Council did not appoint any Medical Health Officer, as they did not deem it necessary. I have much pleasure in reporting that the sanitary condition is, upon the whole, very satisfactory. There has not been any cases of infectious or contagious diseases within the limits of our municipality thus far, although Diphtheria has been raging on our very borders, in the village of Newboro', for the past two months, and has recently broken out at Bedford Mills in the adjoining township, and typhoid fever is also very near to us in the Township of Bedford.

JOHN McGUIRE,
Secretary.

WELLAND.

Township of Crowland.

SECRETARY'S REPORT.

Permit me to state that the Board for this township has never met since its organization. Considering by the terms of Sec. 20 of the Health Act, that it is optional to appoint a Medical Health Officer and Sanitary Inspector, they have appointed neither, consequently there is no report to make to the Coucnil, as required by Sec. 24, and of course none to send to the Provincial Board.

I would also state that there has been no complaint for the abatement of nuisances prejudicial to public health from any quarter of the township, and calling the attention of the Board thereto; also, that this year, in this municipality, there has not been a single case of infectious disease. There are no villages in this township, it being a purely rural constituency, making inspection of premises less urgent. The health of the municipality may be gathered from the following statement: That from the first of July last to the time of writing, there have been five deaths out of a population of 1,213, as returned by the assessor. I have not the second annual report referred to by you. Hoping that the foregoing may prove satisfactory.

ALEX. REID,
Secretary.

LANARK.

Dalhousie and North Sherbrooke Township.

SECRETARY'S REPORT.

This Board wish to express their approval of the action of the Legislature in causing Boards of Health throughout the Province to be appointed, and beg leave to report that this municipality, so far as came under their observation or knowledge, is and has been, this last year, in a good sanitary condition, and consequently have not been required to take action in any special cases.

Dalhousie and North Sherbrooke have not appointed a Health Officer this year, nor Sanitary Inspector.

GEO. CAMPBELL,
Secretary.

NORTHUMBERLAND AND DURHAM.

Darlington Township.

SECRETARY'S REPORT.

With reference to your circular, dated 21st October, I have to state that nothing has been done in this township further than the appointment of a local Board of Health, and the issue of a public notice to the effect that any matter requiring the action of the Board would receive prompt attention. No application has been received in response to that notice, and it has not been deemed necessary to take any further action.

R. WINDATT,
Secretary.

MIDDLESEX.

Dorchester North.

CHAIRMAN'S REPORT.

The six cheese factories in this municipality have been inspected, and were reported to be in a very satisfactory state.

There has been no epidemic or contagious disease in this municipality this season of any serious character, but the inhabitants are in a state of good health in general; we have no slaughter-houses or bone factories, nor any other of those places that would endanger the health of the inhabitants; and further, the swamps and marshy places are getting to be well drained, and we are blessed with a good supply of pure water. To the above state of things we attribute the cause of the general good health of the inhabitants of this municipality.

RICHARD VENNING,
Chairman.

MUSKOKA AND PARRY SOUND.

Townships of Draper and Oakley.

CHAIRMAN'S REPORT.

The Local Board of Health for the above municipality, in making their first annual report, are pleased to be able to report favourably of the sanitary condition of this municipality, the number of deaths up to this time being eleven out of a population of twelve hundred and six, none of which were caused by any contagious or preventable disease. The Board was organized, according to Statute, on the 21st day of June. No Medical Health Officer has yet been appointed, none such practising in these townships. By instructions from the Board, notices were posted up in the post-office and other public places, calling the attention of owners and occupiers of houses to those sections (Schedule A) which relate to the providing of sufficient pure and wholesome drinking water, a matter that has been much neglected in these new settlements; also, to having the privy-pits a sufficient distance from the wells to insure the water from pollution from that cause.

No cases of disease have come under our notice during the present year. It is the intention of the Board to take action at an early day in regard to children attending school, in cases where contagious diseases have existed in the family.

ROBERT McMURRAY,
Chairman.

LANARK.

Drummond Township.

SECRETARY'S REPORT.

A Board of Health was duly organized, but our attention has not been called to any matter relating to the public health for the past year. No Medical Health Officer has been appointed; no particular method in force for the disposal of excreta; there are privies, but no local by-law respecting them. The water is considered very pure; some wells are affected by surface water.

I may state that I have been informed by Dr. Kellock, of Perth, that there are several cases of Diphtheria at present in the Township of Bathurst, adjoining this municipality. Two cases, I believe, have proved fatal. I understand that Measles is quite prevalent in North Elmsley, and that one union school between Drummond and Elmsley, has been closed in consequence.

THOMAS B. MOORE,
Secretary.

BRANT.

Dumfries South, Township.

SECRETARY'S REPORT.

The Board was organized and held their first meeting on the 26th day of May last. At the request of the Board, the Municipal Council appointed a Medical Health Officer and an Inspector. Previously, sanitary regulations were but poorly attended to and but little understood, and many difficulties stood in the way of carrying out sanitary reform; but the Board, anxious to do their duty, went cautiously to work, and through the efforts of the Inspector laying the matter before the people, great reforms were accomplished. The health of the municipality, on the whole, has been good; no epidemics have prevailed to any extent; no statements of infectious or contagious diseases have been reported by the physicians practising in the municipality. Five cases of Typhoid Fever have occurred in the Village of St. George, none in the Villages of Harrisburg or Glenmorris, and only a few in the rural districts. There has been only one case of Diphtheria, and a very few cases of Scarlet Fever in the spring, a great many wells were found impure; manure heaps close to the dwellings, and pig-pens in close proximity to wells, and water-closets in a very filthy condition. Most of these have been remedied, and in another year it is to be hoped that the sanitary condition of the municipality will be in a good state.

D. BAPTIE,
Secretary.

MEDICAL HEALTH OFFICER'S REPORT.

In submitting to you my report, I am glad to say that there has been a good commencement made this year towards checking the causes of infectious and contagious diseases, thereby relieving, to a certain extent, the severity of the sickness, and also the number of cases produced by these causes, and also keeping down the death-rate in our township. I have been called to visit different places where these causes existed, and had them removed as well and as promptly as I could, and saw a good result. I have seen a marked improvement in the condition of the wells and water-closets, which are two of the principal causes of infectious diseases, and which will require your strict attention as a Health Board. I attended one of your meetings and heard some good resolutions passed; some of them were carried out promptly and with good results.

The progress may seem slow, but it will and can only be accomplished by degrees, for the people must be educated to understand the importance of keeping their yards, wells, water-closets, and drains in good order.

Thanking you, gentlemen, for the efforts you have put forth to prevent the causes of disease, and wishing you every success.

E. C. KITCHEN, M.D.,
Health Officer.

PETERBORO'.

Dummer Township.

SECRETARY'S REPORT.

We have had no physician residing in the township for over a year, until about a week ago, a young man from Toronto commenced practice in Warsaw. He will, I presume, be appointed Medical Health Officer next year. This return is necessarily very imperfect, but, as near as I can judge, the township is in a fair sanitary state.

W. DARLING,
Secretary.

LANARK.

Elmsley, North, Township.

SECRETARY'S REPORT.

I beg to report as follows:—A Board of Health was appointed, but with the exception of having some dead animals buried, have not taken active measures regarding public health. Our municipality has been free from epidemic diseases, with the exception of a mild type of Measles, although Diphtheria has been prevalent in the adjoining municipalities of Smith's Falls and Bathurst. I think that probably more active measures will be taken by our local board next year.

P. McKINLEY,
Secretary.

LAMBTON.

Enniskillen Township.

SECRETARY AND CHAIRMAN'S REPORT.

The Board of Health for the Municipality of the Township of Enniskillen beg leave to report that a Board of Health was organized on the 9th day of May, 1884, and as there are two small villages in this municipality, it was necessary to appoint two Sanitary Inspectors, one for each village, and owing to the villages being very small, there is very little to report. Mr. John McGuire reports from Oil City that there were four cases of Typhoid Fever, but not of a very serious nature, as the inhabitants of the village kept the same in a very satisfactory state; there being nothing for him to do except to make an outlet for some water that collected in the water courses of the streets. The Inspector for the village of Marthaville has made no report whatever, but as there have been no complaints from that quarter, and no report of any disease, it is taken for granted that matters are satisfactory. You will please to pardon this brief report, it being the first season and took some time to get thoroughly organized, but hope next season to be able to present a more lengthy report on the sanitary condition of the municipality.

JOHN SMITH, Chairman.
JOHN L. WILSON, Secretary.

WELLINGTON.

Eramosa Township.

SECRETARY'S REPORT.

The sanitary work done by the Board of Health for the Township of Eramosa, during the year ending 1st December, 1884, is confined to two items, as follows :—

1st. A complaint was made that a pig-pen in a certain part of the village of Rockwood was a nuisance, and endangered the health of parties in immediate neighbourhood ; the Board requested the owner to remove the nuisance, which was promptly attended to.

2nd. A complaint was made that a badly constructed privy-vault, belonging to a party also in Rockwood, discharged its contents into a neighbouring lot close to the kitchen window, and the complainant also stated that his wife was ill on account of the nuisance. The place was visited by the Board who found the nuisance as represented, the privy complained of being badly constructed, and located on the top of a ridge of rock, and, as represented by complainant, carried the contents into his lot. A notice was accordingly served on the party on whose place the nuisance existed, requiring its removal to a location to be determined by the Board, and instructing them to communicate with the Board, and the Board on being communicated with, attended and selected a proper site, and the matter was thus disposed of.

The health of the municipality is good, no contagion having existed during the year ; water supply good.

HUGH BLACK,
Secretary.

Township of Erin.

SECRETARY'S REPORT.

As the local Board for this municipality was but lately appointed, and having had one meeting of the Board since, and nothing being before the Board no business was transacted, consequently I have no report, so far as the work of the Board is concerned, to make.

THOMAS YOUNG,
Secretary.

HALTON.

Esquesing Township.

SECRETARY'S REPORT.

This Board was organized in June last, and at its second meeting decided to apply to the Municipal Council for the appointment of a Sanitary Inspector.

The Council at once appointed an officer and he entered upon the discharge of his duties by visiting every house in the several villages, and recording in his memorandum book answers to the questions therein set forth. He also left at each house visited a printed sheet containing extracts from the Health Act for the information of the inhabitants. He has also, since the outbreak of Diphtheria in the village of Glenwilliams, visited the infected houses in that village and posted up the necessary notices. There are still eight or ten cases of Diphtheria there, but no deaths since my former letter. In the village of Norval there have been no deaths reported ; there are also some cases outside of the villages—one a farmer's wife, and at last account other members of the family were affected. Dr. Todd informs me that in some cases he cannot get parents to isolate

the patient, and it is most difficult to get them to use disenfectants, or to adopt proper measures with reference to the disposal of excreta, wash water, house slops, etc. There seems to be no way of getting over difficulties of this kind, except by regulations properly enforced by a Medical Health Officer.

J. MURRAY,
Secretary.

Township of Euphemia.

MEDICAL HEALTH OFFICER'S REPORT.

In compliance with Sec. 1 of by-law relating to public health, I have the honour to report a good condition of health throughout the municipality.

No epidemics of a contagious or infectious character have existed, to my knowledge, since my appointment, nor have any complaints been made to me regarding sanitary matters. Although I have good reasons for believing that many of the school-houses in the municipality require improvements in ventilation and general school hygiene, yet, as the trustees have made no application to me, I can make no report of their condition.

This delinquency, I am of opinion, arose not so much from indifference or neglect as from a want of knowledge relating thereto by the various Boards of Trustees.

Doubtless there are many things which require the attention of the Sanitary Inspector, or possibly the Medical Health Officer, in the municipality. But owing to a want of information among the people they have not been brought under my notice.

I can, therefore, only report an excellent condition of general good health in the township. I trust that in future all may feel the great necessity of carrying out the requirements of this excellent by-law.

M. DAVISON, M.D.,
Medical Health Officer.

WENTWORTH.

Flamboro', East, Township.

MEDICAL HEALTH OFFICER'S REPORT.

It is my pleasing duty to report to you that during the past year your municipality has been exempt from any widespread outbreak of disease of an epidemic nature. It is true that you have been visited with some diseases of an infectious character, but they have been isolated cases and consequently endemic.

Of these, I notice that Scarlet Fever has been the most frequent visitor, having sometimes four or five cases in one family. It did not spread from home to home rapidly, but where it spread at all, it was owing to carelessness, from the allowing of visitors or from improper disinfection.

Diphtheria we see cropping up here and there in almost every month in the year; this, in a great measure, is due to uncleanliness about the premises.

Malaria we principally find along the banks of our streams and about marshy districts, hence the necessity of having said places properly drained when we see that it is required.

While we are thankful for the health that we are now enjoying, let us not close our eyes dreaming that this state of things will always last; for in the past we have been visited with diseases of an epidemic nature that have spread from home to home, that might have (in a measure) been avoided had prompt means been used, and the day may come when we shall have a like visitation.

Let me point out to you something that might be done in this municipality for the furtherance of public health:

(1) Make it compulsory that the trustees of each school section have the school privies emptied of their contents at least twice a year.

(2) Further, make it compulsory that the Trustees of each section have the privies properly disinfected at least once a month.

(3) See that all cases of an epidemic nature be reported to you at once by the attending physician, so that your Board may take the proper steps towards preventing the spread of the same ; and, furthermore, that all such cases present a physician's certificate before being admitted back to school again.

I am fully convinced that if your Board could have these suggestions properly carried out, it would be a "boon" to the inhabitants of this or any other township, and would greatly promote the ends we have in view by the furtherance of public health.

J. O. McGREGOR,
Medical Health Officer.

LENNOX AND ADDINGTON.

Fredericksburg Township.

CHAIRMAN AND SECRETARY'S REPORT.

We beg leave to report that the Municipal Council of North Fredericksburg, in compliance with the Act passed at the last session of the Legislative Assembly, regarding the sanitary conditions of the township, appointed a Local Board of Health, and at our first meeting we considered that it was not necessary to appoint a Sanitary Inspector. We also passed a resolution asking the medical men of the county to report to the Secretary all cases of Scarlet Fever, etc., that came to their notice, by which we found that there were a few cases of Scarlet Fever, none of which could be considered malignant. When we found any cases we notified the parties to make a thorough cleansing before they allowed themselves to mingle with the public, and by so doing it did not become infectious, none getting beyond the person first attacked.

IRVINE PARKS, Chairman.
P. R. McCABE, Secretary.

LINCOLN.

Gainsboro' Township.

SECRETARY'S REPORT.

In accordance with the provisions of *The Public Health Act*, I beg leave to submit the following report upon the work done by the Board and the sanitary condition of the township.

This Board having been organized but a short time, I will therefore have but little to report this year. At the meeting of the Board, on the 3rd November, complaint was made by S. G. Wiggins and James Wilson that A. McKeagen, J. W. Johnston and J. Jamieson, had deposited manure on the street in front of the public school in Wellandport. The Secretary was directed by a motion of Messrs. Roszel and Ginther, to notify the parties above named to remove the nuisance within eight days, which has been done.

As regards the sanitary condition of the township, I have to report that it is generally good. There is no epidemic disease prevailing at present.

S. KENNEDY,
Secretary.

WELLINGTON.

Garafraxa, West, Township.

SECRETARY'S REPORT.

From information received from the different parts of the municipality and from the Medical Health Officer, not having a Sanitary Inspector, I cannot give as correct a report as I would like to. Altogether the sanitary condition of the municipality is very good. Although having a full Board and a Medical Health Officer, there is not that interest manifested that there should be. The organization being new, there will no doubt be an improvement another year.

JAMES KENNEDY,
Secretary.

WENTWORTH.

Glanford Township.

SECRETARY'S REPORT.

In pursuance of section number 24 of *The Public Health Act of Ontario*, requiring the Secretary of the Board of Health to submit to such Board for adoption a report of the sanitary work done during the year, and of the sanitary condition of the municipality,

I beg, therefore, to report that very little sanitary work has been required to be done by the health officers of the municipality, for, as the requirements of *The Public Health Act* became known, they have been complied with generally so as to prevent coercion in the matter, and that, together with the fear of Cholera, has caused the people to take every precaution to prevent the introduction or spread of disease of any kind. As to the sanitary condition of the municipality, it has been exceedingly good during the year, there having been very little sickness, and no epidemic has prevailed until recently, when there have been a few cases of Typhoid Fever and Diphtheria. Some of the latter sickness have proved fatal.

THOMAS CHOATE,
Secretary.

HURON.

Goderich Township.

CHAIRMAN'S REPORT.

The Local Board of Health report as follows:—In June they visited the school-houses in the township (ten in number), and notified the trustees to attend to repairing the privies, and have them thoroughly cleaned out and keep them clean. Each school is well supplied with good water. These repairs have all been completed. The slaughter-houses were also visited, and the suggestions made complied with, and no offensive smell emanates from them. No complaint was made to any member of the Board regarding either a public nuisance or any on private property. No Health Officer was needed, and consequently none was appointed. The sanitary condition of the township is good. No large swamps exist, the natural drainage obviates this, the township being bound on the west by the lake with high banks, on the north-east by the River Maitland, and on the south-west by the Bayfield River. This gives superior drainage facilities. A large amount of under-draining is done, so that stagnant pools are unknown. The manure accumulating around barns and stables is removed by the month of June each year into summer fallows and root crops. There are many springs, and where these do not exist

wells from twenty to sixty feet deep are dug, so there is a plentiful supply of water, unless during a couple of months in a very dry summer. If any farmers are careless it is a very small minority, and these are being shamed into imitating their painstaking neighbours.

GABRIEL ELLIOTT,
Chairman.

LEEDS AND GRENVILLE.

Gower, South, Township.

CHAIRMAN'S REPORT.

I, the undersigned, Chairman of Local Board of Health of said township, report as follows:—

We met and organized, but as there was no epidemic of any kind and the matter was new to us, we thought best to give some study and thought of the subject with which we had to deal before taking further action thereon, and as there were no complaints of nuisances, and as we neither heard of nor saw any bad effects from the *nuisances** the Act is intended to guard us against, we took no further action on them. The health of the township has been good.

HUGH BOLTON,
Chairman.

HURON.

Grey Township.

SECRETARY'S REPORT.

I herewith have the honour to forward you a copy of the report of the sanitary condition of the municipality of the Township of Grey, in the County of Huron, for 1884:—

A Local Board of Health has been appointed by the Municipal Council, in accordance with *The Public Health Act, 1884.*

The chief objects that have engaged its attention during the year were proper drainage from the cheese factories to carry away all the refuse whey, and the cleansing of all the public school yards, wells and privies within the municipality.

There is no Health Officer appointed.

By-law enforced relating to privy-pits. Wells, as far as I know, are not affected by excreta.

There have been four cases of Scarlet Fever and three of Diphtheria.

There is a by-law regarding isolation, which will be carried out if required.

WILLIAM SPENCE,
Secretary.

WELLINGTON.

Guelph Township.

SECRETARY'S REPORT.

In accordance with Section 24 of *The Public Health Act* of Ontario, and Section 3 of Schedule A, attached thereto, the Board of Health have to report that the members of the Board met on the 9th day of June in conformity with the Act, and organized.

* If there are nuisances, why not abate or destroy them, whether people complain or not. We know there are robbers in the community, but don't know whether or not they will rob us, but we want to leave nothing in their way.

The Board again met on the 21st of June, when a letter was submitted from Dr, Cowan, calling the attention of the Board to the terribly filthy state of a part of a house the other portion being occupied by Mr. Pick, on Lot 7, 9th Concession, Division C., and the danger to Mr. Pick in consequence of living in such close proximity to so much filth, and that it might be the nucleus of some fell disease from which the whole neighbourhood might suffer.

The matter was referred to Mr. Watson to take what action he might deem necessary to have the nuisance removed, and in consequence of the owner of the premises being away and reported to be of unsound mind, he deemed it safest to have the premises cleaned at once, which was done at a cost of eight dollars.

The Board met on the 21st of September to consider a complaint from Mr. George Hirst, that the scavenger of the City of Guelph was in the habit of depositing the refuse, etc., which he collected in the city, in a field adjoining his residence, and he believed that both himself and family were suffering from its effects.

The Board, after considering the matter, instructed the Secretary to notify the scavenger and the owner of the property to have the nuisance removed within ten days.

On the 24th a letter was received from Mr. Hughes, stating that he considered he was acting under the city authorities, but would deposit no more soil on that ground, and would remove what was there complained of as soon as possible, which we believe has been done.

In connection with this case we believe it may be a serious matter for the city where they may deposit their soil, but it becomes far more serious for the township when they make it their nuisance ground.

The Board would also report that the general health of the township has been good ; one case of Scarlet Fever of a very mild form was reported, and two cases of Typhoid Fever, informally reported, both of a mild type, are all the diseases that have come to the knowledge of the Board.

(Signed) GEO. A. DARBY, Chairman.
A. McCORKINDALE, Secretary.

YORK.

Gwillinbury, East, Township.

CHAIRMAN'S REPORT.

The Local Board of Health respectfully report as follows : On the 28th day of June they held their first meeting, when Mr. Cody was elected Chairman. Subsequent meetings were held, when the appointment of John Salter and Nesfield Thirsh, as Sanitary Inspectors, was recommended to the Council.

A draft by-law providing for the amending and better adapting of the by-law appended to *The Public Health Act* to the requirements of this municipality, was adopted and reported to the Council, and passed by said Council, copies of which were distributed through the township.

As far as the Board is aware there are no cases or even symptoms of contagious diseases in the township at present. Three cases of Typhoid Fever have occurred during the year (though only one was reported upon by the attending physician), but the whole were successfully treated, the three patients having recovered.

BENJAMIN CODY,
Chairman.

NORTHUMBERLAND AND DURHAM.

Township of Hamilton.

CHAIRMAN'S REPORT.

The necessary steps have been taken to administer the law, each member of the Board assuming his duty and proceeding to perform the duties required of him. Reports have been handed in from the different members of the Board that no disease of any contagious nature had been heard of in the municipality. The Board ordered the Secretary to procure the blank forms that the law directs, in such quantities as he might deem would be required, the cost of which will be paid out of the general funds of the corporation.

A. R. EAGLESON.

HURON.

Hay Township.

SECRETARY'S REPORT.

In making this first Report of the sanitary condition of this township, I am happy to state that since the beginning of the present year we have been eminently free from all infectious diseases of a bad type. That since the Board of Health was organized in May, we have had none whatever. During February and March, and part of April, the Measles were quite prevalent throughout the township, a number of schools having been closed in consequence. The disease was confined in nearly all cases to young people. No deaths occurred. There have been no cases of Scarlet Fever under treatment of physicians in the township. About the usual number of cases of Whooping-Cough, and a few have been treated for Diphtheria of a very mild type.

Not a single case of Small-pox has been reported, and but three or four cases of Typhoid Fever, one only resulting fatally; these all occurred before the Board of Health was organized, and in all the above cases the usual disinfectants have been strictly enforced.

The Board of Health in our township, as now constituted, seems to be alive to the importance of strictly carrying out the provisions of *The Public Health Act* of Ontario. As yet we have appointed no Sanitary Inspector, as his services so far seemed unnecessary, two of the resident physicians of the township being members of the Board.

SAMUEL FOSTER,
Secretary.

PERTH.

Hibbert Township.

SECRETARY'S REPORT.

Although a Local Board of Health was established in the Township of Hibbert, I have nothing to report, the Board having done no more than merely organize. The health of the township was never better, so that there was no urgency on the part of the Board to make any official interference with the ordinary habits of the people.

T. CARROLL,
Secretary.

NORFOLK.

Houghton Township.

CHAIRMAN'S REPORT.

Pursuant to Section 3 of Schedule A of *The Public Health Act of 1884*, it becomes my duty, as Chairman of the Local Board of Health for the Township of Houghton for the current year, to report to your honourable body the work of the Board during the period of its existence.

The organization of the Board took place on the 9th day of June last, when I was elected Chairman, George Bundy acting as Secretary, in conformity with the Act.

Nothing regarding the sanitary condition of the township or other matters requiring the attention of the Board having been brought before their notice, the Board adjourned, to meet again the 8th day of October.

The members of the Board at this second meeting took into consideration the necessity of the appointment of a Sanitary Inspector. It was fully discussed, and a resolution passed to the effect that in consequence of the absence of any contagious disease, it was considered unnecessary to appoint said officer.

One case of Typhoid Fever has been reported, but the directions of the attending physician having been complied with, the patient recovered and other cases were prevented.

About the 1st of November, a letter was received by the secretary that there were some cases of Diphtheria in the north-western part of the township. The members of the Board in that neighbourhood visited the families to learn the particulars. They found three cases which the medical attendant pronounced Diphtheria, and some other cases of sore throat which were considered doubtful.

The directions as to isolation having been observed, the patients at last accounts were recovering, and no new cases reported.

MOSES W. WHITE,
Chairman.

HURON.

Howick Township.

SECRETARY'S REPORT.

Mr. James Agnew complained of the condition of out-houses in rear of the brick block, Gorrie. The same was put in proper condition at the owner's expense, on being notified by me.

Mr. Robert Mahood notified the Secretary of a complaint against D. D. Cox of Newbridge, for having his hog-pen in an improper place. The same was removed by Mr. Cox on notice from me.

Complaint was made of the sanitary condition of the Fordwich school grounds and well. The committee appointed to examine the same reported that the trustees had to put well, etc., in proper order.

There were three cases of Typhoid Fever during the summer; one died and the other two recovered. Means were employed as follows to prevent disease from spreading: Discharges from bowels passed into carbolic solution, carbolic and tincture of iodine allowed to evaporate in room, and bed clothes and soiled linen soaked in a solution of carbolic acid when removed from patients, then washed.

The sanitary condition of the municipality appears to be very favourable at present. There is no Medical Health Officer.

WILLIAM DANE,
Secretary.

Hullett Township.

SECRETARY'S REPORT.

In submitting to you our first Annual Report, I have the honour to state that, in June, 1884, our first Board of Health was duly organized. John McMillan was appointed Chairman, and Oliver Young of Landesboro', Physician, was appointed Medical Health Officer. There was no other business done by said Board during said year of 1884, and I believe that the sanitary condition of this township was during said year and now is good. I beg also to submit to you the annual reports of our Medical Health Officer and our Chairman, as under:—

I beg leave to report to your honourable body that the state of health in the Township of Hullett at the present time is in all respects favourable, and we are exempt from contagious diseases generally.

DR. O. YOUNG,
Medical Health Officer.

As Chairman of the Board of Health, I have to report to your honourable body that we have only had one complaint of any nuisance in the township, which was respecting a slaughter-house adjoining the Town of Clinton. Before calling the Board together I wrote to both the owner and occupant of the premises complained of, and the nuisance has been abated as far as I am aware. This is all the work performed by the Board. I must congratulate you upon the healthy condition reported by the Medical Health Officer to the Board of Health, whose report is laid on the table with this.

JOHN MCMILLAN,
Chairman.

P.S.—I have also to report that there was only one meeting of the Board. Hoping your honourable body will make such provision as in your wisdom you see fit for remuneration for services.

J. McM.

There has been no meeting of our Board since June last. I have, therefore, had no opportunity of submitting this report for adoption, as provided in the 24th Section of *The Public Health Act of 1884.*

JAS. BRAITHWAITE,
Secretary.

BRUCE.

Township of Huron.

SECRETARY'S REPORT.

The Local Board of Health for this township was duly organized on the 16th day of June, 1884, and appointed Thomas Moore Health Inspector. He visited two cheese factories and recommended a better system of sewerage, which was duly carried out, and removed other nuisances which he found on the roads and commons of this municipality: also, caused privies and vaults in the Village of Ripley to be cleaned and disinfected. The health of this municipality is reported good, no epidemic disease existing therein, only three or four cases of fever occurring during the summer.

ROBERT MONTGOMERY,
Secretary.

SIMCOE.

Innisfil Township.

SECRETARY'S REPORT.

I have the honour to inform you that the report of the local Board of Health is very satisfactory, and the township is healthy, so much so that there is no contagious disease.

CHARLES PALLING,
Secretary.

LENNOX AND ADDINGTON.

Townships of Kaladar, Anglesea, and Epping.

SECRETARY'S REPORT.

I would have made a report of our local Board of Health before, but owing to the general good health in this part of the country, we did not wish to make any great expense on the municipality.

Since the epidemic of Small-pox, however, we have been vigilant and on the look-out. On the 6th inst. the Board met to consider a case of a desperate act of one who ran away from the Small-pox hospital at Stoco without bearing a certificate of being disinfected. We have placed a strict watch over him and the family to keep them isolated. A great number of people are getting vaccinated by a doctor, whilst one out of ten only proves effectual. People are intending to practice themselves to vaccinate the rest of their family. What will be the result if the public resort to vaccinating among themselves, using matter from persons probably whose health is quite objectionable? This is not suggesting the matter, but they are facts which will soon be brought into practice. If vaccination is a prophylactic against that loathsome disease, and the Government* alert in the interests of the public health, why then so negligent in this most important part to prevent that disease?

So far the Small-pox is under control, but it is extremely dangerous in these back countries; the shanties all crowded with men, teams continually going back and forward, causing great anxiety in general.

O. M. ROLUFS,
Secretary.

GREY.

Keppel Township.

SECRETARY'S REPORT.

In reply to yours of the 21st ult., I have to say that the Board of Health for the Township of Keppel organized, but it being a newly settled township, with no large villages, it was not thought prudent to meet again till there might be some necessity for a meeting. There has not yet been any apparent reason to meet, so we have nothing to report.

JAMES SMITH,
Secretary.

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*If the Clerk reads the Act carefully over, he will find that the Government have made provisions regarding vaccination, and it depends on the local Boards whether these provisions are carried out or otherwise.

FRONTENAC.

Township of Kingston.

SECRETARY'S REPORT.

I have to report that in accordance with the provisions of *The Public Health Act*, the Township Council appointed a Board of Health, but owing to the absence of disease in this locality of any contagious kind, and the general healthy condition of the inhabitants, there has been nothing further done. It is reported that Small-pox has broken out about 35 miles north-west of this place. What precautions are necessary under the circumstances? Where can a supply of vaccine be obtained? What authority have township councils to establish local quarantine? What steps should be taken to establish a quarantine? The Board of Health will appoint a Medical Health Officer at its next meeting.

JNO. SIMPSON,
Secretary.

MIDDLESEX.

Township of Lobo.

SECRETARY'S REPORT.

That the Municipal Council of the Township of Lobo manifested a ready acquiescence with the several enactments of the Public Health Act by the appointment, at the May meeting, of three members, namely: Messrs. Alex. Campbell, Archibald Sinclair, and Peter L. Graham, M.D., who, with the Reeve and Clerk, compose the Board of Health for the Township of Lobo.

The Board, thus organized, held its first meeting in the Town Hall, Lobo, on the 9th of June, 1884, when the Reeve was duly elected Chairman of the Board. The Secretary was instructed to provide a minute book for the use of the Board.

The Board considered it unnecessary to appoint any Medical Health Officer at present, as one member of the Board is a medical practitioner, and the sanitary condition of the Township of Lobo is very good.

The Board has held several meetings since organized, but no cases of contagious diseases have been reported to the Board, although the Board discovered a few mild cases of fevers and inspected them, they being very few, and nothing serious.

E. R. BARCLAY,
Secretary.

London Township.

SECRETARY'S REPORT.

In accordance with the requirements of section 24 of *The Public Health Act, 1884*, I have prepared the following report of the sanitary work done by the said Board since its organization, and of the sanitary condition of the said municipality for your consideration,

The first meeting of the Board was held in the Town Hall, St. Johns, on Monday, May 19th, 1884. Peter Elson, Esq., Reeve of the township, was appointed Chairman. The Secretary was instructed to get 200 blank forms for medical practitioners printed. Board adjourned.

Board met June 26th, 1884. A complaint regarding the shed of Edwin Brooks was referred to the Medical Health Officer. The Secretary was instructed to get 200 cards

printed, in accordance with rule 4 of section 17 of Schedule A, appended to *The Public Health Act, 1884*, and 100 copies of said Schedule (as amended by by-law of Municipal Council) printed for distribution.

Board met July 15th, 1884. Licenses were granted to twenty-six slaughter-houses and seven cheese-factories, which had been personally inspected by the Sanitary Inspector and reported favourably upon by him. The Inspector was instructed to inspect a nuisance complained of as existing on lot 18, concession 2, and any other premises complained of, under directions of the Medical Health Officer, pending the meeting of the Board, which adjourned to meet on the call of the Chairman.

A meeting of the Board was held in the County Buildings, London, on Saturday, October 11th, having been called by the Chairman for the purpose of considering a petition signed by R. Thompson and others complaining that the water works' dam on the river Thames, dividing the Township of London from the Township of Westminster, was a public nuisance and dangerous to the public health, and praying that steps be taken for the removal of the same.

The Sanitary Inspector read a report prepared by him after personally investigating the alleged nuisance, and interviewing the greater number of the persons living near the banks of the said river, in the Township of London. Dr. Bice, Medical Health Officer, addressed the Board, stating that in his opinion the cases of sickness spoken of in the report of the Inspector were not caused by the water works' dam, and that if any diseases were caused by the same, they would be Typhoid Fever, Diphtheria, or similar diseases, of which there were no cases reported.

It was then moved by T. A. Langford, seconded by E. Robinson, and resolved :— That this Board take no action in the matter. Board adjourned.

The sanitary condition of the township has been during the summer and fall very good. This will be more fully treated of in the report of the Medical Health Officer presented herewith.

JAMES GRANT,
Secretary.

MEDICAL HEALTH OFFICER'S REPORT.

After the proper organization of the Board, cards, on which were printed the names of the different contagious diseases mentioned in the Act, were sent to each of the resident physicians of the township, but up to date not a single case of any of the above-mentioned diseases has been reported. I am therefore led to conclude that either our township has been peculiarly exempt, or there has been gross carelessness on the part of my medical brethren. I have not had anything of the kind to look after, and possibly my medical friends have been similarly favoured. Complaint was made some time during the summer of the sanitary condition of Carling's Creek. It was supposed to be the immediate cause of Typhoid Fever in London East. Our worthy Inspector and I made a visit to that locality, and found that there was considerable cause for complaint. The filth from pig-pens and slaughter-houses impregnated the waters of that stream, rendering it certainly unfit for use, and possibly a source of mishief in the production of Typhoid; but the remedy would involve considerable expenditure, and consequently we concluded to memorialize the Provincial Board on the subject. We have taken action in two or three cases of nuisances, such as pig-pens, unwholesome smells, foul drinking water, etc., in all of which we have found but little trouble in enforcing the law. Our Inspector visited all the slaughter-houses and cheese-factories in the township, and found them quite up to the requirements of our modification of schedule A. From our recent organization, and from the fact that most contagious diseases occur during the winter months, I did not expect or look for a voluminous report to present to the Sanitary Board at this season of the year.

M. BICE, M. D.,
Medical Health Officer.

WELLINGTON.

Luther East Township.

SECRETARY'S REPORT.

Our Board has not yet got thoroughly into working order, and, being something new, we were at a loss as to how to proceed about business; but we expect to be able to attend to matters connected with the sanitary interests of the township more thoroughly in future. In the Village of Luther, which is in this township—East Luther—there have been a great many cases of Typhoid Fever within the past five or six years, generally a few cases every fall, and three years ago there were as many as ten deaths, besides a number of other cases that recovered. We had three cases last fall, but no death, and the doctors seem to be puzzled to know the cause.

I hope you will find the above satisfactory.

R. E. HAMILTON,
Township Clerk.

MUSKOKA AND PARRY SOUND.

Township of Macaulay.

SECRETARY'S REPORT.

Annual report of the Local Board of Health of the Township of Macaulay for the year 1884:—

The removing of two slaughter-houses, and the disinfection of the old sites, and the cleansing and disinfection of the new slaughter-houses; also, the examination of the Free Methodist burial ground by the Medical Health Officer, and the said officer ordered the removal of the corpses, as the said ground was in too close proximity to a creek used for domestic purposes. The Board has also ordered the Medical Health Officer to vaccinate all the children of the township. No Sanitary Inspector appointed, but Dr. Shaw is our Medical Health Officer.

WILLIAM GOHM,
Secretary.

ESSEX.

Malden Township.

SECRETARY'S REPORT.

In conformity with your request, contained in your circular of the 21st October, I have to report that owing to the generally healthy state of the Township of Malden for this year, the Local Board has very little to report on.

The Council repealed the by-law appended to the *Health Act*, as they considered many of its provisions unpractical and difficult to enforce in a rural municipality, and decided to be governed by the provisions of the Act itself, in the case of diseases breaking out in the township.

The Local Board was organized on the 9th June last, and appointed the Reeve Chairman thereof. Two meetings were held during or up to this time.

No Medical Health Officer was appointed. The township was divided into five sections, each section under the supervision of a member of the Board.

Since the Board was organized there was one death from Scarlet Fever, the only case in the township; every precaution was taken to prevent the spread of the disease by all parties interested. Two cases of Typhoid Fever of a mild type also occurred, but the parties are recovering. These three cases were the only cases of contagious diseases known to have taken place in the township.

In view of the threatened danger of the Cholera reaching us next year, the Board contemplates organizing a more complete plan of work for another year.

HENRY BOTSFORD,
Secretary.

Maidstone Township.

SECRETARY'S REPORT.

The Board of Health for the Township of Maidstone have nothing to report. The sanitary condition of the township was such that no contagious diseases have broken out, and the Local Board of Health had nothing to do in connection with their office; therefore I am instructed by the Chairman to report as above.

T. F. KANE,
Secretary.

NORTHUMBERLAND AND DURHAM.

Manvers Township.

CHAIRMAN'S REPORT.

The Local Board of Health of the Township of Manvers beg leave to report that they met and organized, as directed by statute, and they have much pleasure in stating that the inhabitants of this township during the past year have been blessed with general good health, being as far as known to us comparatively free from Diphtheria, Typhoid, Consumption, and all other infectious diseases.

That while any of such cases that they have been cognizant of cannot, in their opinion, be traced to defective drainage, etc., this Board is of opinion that in view of the probability of Cholera visiting this continent during the ensuing season, and the fact of Small-pox being in the County of Hastings, that too much care cannot be taken to keep such diseases from our midst, or in case such may be introduced to take such measures as they may from time to time think proper or be advised by the Provincial Board of Health.

That it would in their opinion be advisable for the Council to have printed a sufficient quantity of the by-law as recited in the Statute of Ontario respecting public health, and cause one of such copies to be left at every house in this township by the assessor when performing his other duties, as this Board are satisfied that very few of the inhabitants are aware of the duties required of them by such by-law, while the majority do not know that such a law is in existence.

That this Board are happy to say that no complaints respecting any matter connected with the public health have been made to them during the present year.

That the sum of twenty dollars will be required to be granted to this Board to defray the expenses thereof for the current year.

W. R. PARKER, Chairman.
ALFRED RYLEY, Secretary.

YORK.

Township of Markham.

SECRETARY'S REPORT.

The work of our Board has been very light during the year owing no doubt to the fact that there has been no contagious diseases reported, as required under the Act in that behalf.

There was only one complaint lodged as to any place being in so unsanitary a condition as to render it a nuisance

Upon these facts the Chairman did not think it necessary to call the Board together

but twice during the year for the purpose of disposing of the above mentioned complaint, the Secretary having called a previous meeting for the purpose of organization.

The complaint laid was against a butcher residing at the Village of Thornhill, who occupied a slaughter-house and had an apparatus for rendering fat, and also a pig-pen adjoining, causing a very bad stench. The Board dealt promptly with the matter, instructing the Medical Health Officer and the Sanitary Inspector to at once examine the premises, and if a nuisance was found to exist to have it removed forthwith, which the said officers with diligence carried out, after some difficulty, to a satisfactory conclusion, as will appear from their reports forwarded herewith.

The Board congratulate themselves upon the sanitary condition of the municipality, and are pleased that their public health matters have cost them so little either in time or money.

JOHN STEPHENSON.
Secretary.

MEDICAL HEALTH OFFICER'S REPORT.

In my first annual report, allow me to congratulate this municipality upon the efficient Council which took such opportune steps in the formation of the Board of Health.

Former experience has taught the value of health committees for the prevention of the spread of contagious diseases, and if this Board shows due vigilance and enthusiasm it cannot but stimulate confidence and emulation on the part of the people, who are the benefited.

In rural districts we do not have to face in a great degree the baneful effects of deficient sewage and want of good drinking water, but in the disposal of garbage, etc., we are subjected to the same influences as people in cities and towns.

In the erection and arrangement of rural dwellings, I beg to point out that more attention should be paid to the following points:

1. Greater size of the rooms, with ample means of ventilation.
2. Greater distance between the privies and water supply.
3. Thorough drainage to lessen the subsoil dampness, which increases warmth and healthfulness.
4. If there must be a garbage pile, to have it at a safe distance from the dwelling, and removed at stated intervals.

In the matter of prevention of the spread of contagious diseases, a potent factor is the power of head masters in schools; and I would recommend that the attention of school teachers be called to the school law which enacts that "the masters of every school shall see that no pupil is admitted to or continues in any of the schools who is affected with or has been exposed to any contagious disease, until all danger of contagion from such pupil or from the disease or exposure shall have passed away, as certified in writing by a medical man."

In rural places no one perhaps is more cognizant of the prevalence of disease than the school teachers, and by their co-operation (which is compulsory), much may be done to prevent their spread.

I am pleased to state that no cases of contagious or infectious diseases have been reported during my term of office, which goes to prove either the excellent sanitary condition of the municipality, or gross negligence on the part of those who should report—the former being evidently the factor.

In one instance only have we been called upon to insist that sanitary matters should be improved upon. I refer to the slaughter-house in Thornhill, owned by Mr. Muldoon. After inspection, both by the sanitary officer and myself, we have for the time being, I hope, arranged matters satisfactorily and amicably to those directly interested, and for the general benefit of the public health.

In closing this report I wish to draw attention to the efficient aid and substantial services rendered by our Secretary, Mr. J. Stephenson, upon whom much of the arduous duties have fallen.

W. E. HAMILL, M.D.,
Medical Health Officer.

HASTINGS.

Mayo and Carlow Townships.

SECRETARY'S REPORT.

As to the business of the past year, your Local Board of Health cannot report any action so worthy and meritorious as to draw from your honourable Board exclamations of satisfaction and joy. Pursuant to Section 18 of *The Public Health Act* of 1884, a meeting was called for Monday, the 26th of May, 1884; but for different reasons, some of them good enough, it was a failure—the only one present being your obedient servant, the Secretary. There seems to be considerable difficulty in maintaining any organization which connects these two townships unless its members are thoroughly alive to its necessity, partly on account of the length of road necessary to be travelled on account of the rough mountainous ridges that traverse different parts of both; in one instance two of the members of our Board live about thirty miles apart.

JOHN BREMNER,
Secretary.

MUSKOKA AND PARRY SOUND.

Medora Township.

SECRETARY'S REPORT.

In making a report for the Municipality of Medora and Wood I beg to say: That we have no Medical Officer on this Board, in fact there is no medical man residing within a convenient distance.

That there has been only one case of an infectious disease in this municipality during the year, viz., a case of so-called Typhoid Fever, combined with Pneumonia, and as it seems no steps were taken to isolate the case the fact of its being fever may be doubted.

I believe, as to the disposal of sewage, it seems usual throughout these townships to have pits and to cover with soil. As far as could be found, in no case was sewage allowed to flow into the lakes.

I am sorry to say that small interest is taken in the Board itself, only one member attending its meetings. The feeling of the people seem to be that a Board of Health is not necessary here, but if not out of place I would suggest that some provision be made for paying members' travelling expenses, time, etc., as they have to spend a good deal to attend meetings.

HENRY C. GUY,
Secretary.

ESSEX.

Mersea Township.

SECRETARY'S REPORT.

The Local Board of Health for the Township of Mersea, in presenting their first annual report on the sanitary condition of the municipality, beg to say that although under the requirements of *The Public Health Act* a Board has been formed, it cannot be claimed that it has been actively engaged in matters relating to the public health, inas-

much as there have been no extraordinary diseases in the township during the present year.

No Health Officer has thus far been engaged. The Village of Leamington, which, before its incorporation, formed part of the Township of Mersea, has five medical practitioners, one of whom has been appointed by the said Corporation of Leamington as Health Officer for that place, and this gentleman—Dr. Charles Chamberlain—has kindly permitted this Board to state that he intends in his report to include the Township of Mersea.

The population of this municipality being, with the exception of the small Village of Wheatley, in the extreme eastern corner of the township, strictly an agricultural population, the questions required to be answered, as contained on page 148 of the second annual report of the Provincial Board of Health, cannot, therefore, properly be complied with.

It would perhaps not be out of place to state that the Township of Mersea has a very large and effectual drainage, there being no less than about twenty large tap-drains constructed within its limits, some of these discharging into Lake Erie and some into Lake St. Clair, through the adjoining Townships of Tilbury West and Rochester.

There have, however, been a few cases of Enteric Fever in the southern part of the township in the immediate vicinity of the Village of Leamington, and two deaths occurred during last week, but excepting these the Board have no knowledge of any diseases in the township.

Should any epidemic arise in the Township of Mersea the Board will ever be mindful of the duties devolving upon it, and take such precautions and make such provisions as will tend to the preservation of the general health of the people.

N. ROLFSON,
Secretary.

MIDDLESEX.

Metcalf Township.

SECRETARY'S REPORT.

The undersigned, in compliance with the requirements of *The Public Health Act* 1884, begs leave to report as follows:—

That the Municipal Council of the Township of Metcalfe did, on the 5th day of May, 1884, appoint John Trueman, Richard Henery and Peter Campbell, who, with the Reeve, Henry Gough, and John Hutton, Clerk, acting as Secretary, composed the Board for the said township for the year 1884.

The Council also appointed Alexander Nixon, M.D., Medical Health Officer, to be paid at the rate of four dollars per day when employed by the Board of Health.

The Board held its first meeting at the Town Hall, in the Village of Napier, on the 19th day of May, 1884, when John Trueman was duly elected Chairman of the Board.

The Board visited the different cheese factories in the township (four in number), and made a thorough examination of each, and, as a whole, found everything satisfactory.

The Board also held meetings in the months of July and November, deeming it not necessary to hold meetings monthly, and thus have to add to the expenditure of the municipality.

The Board did not appoint an Inspector, deeming it not necessary to do so, as no sickness of any importance was heard of in the municipality; and, as the Board did not employ the Medical Health Officer during any part of the year, consequently no report from that officer has been received.

JOHN TRUEMAN, Chairman.
JOHN HUTTON, Secretary.

NORFOLK.

Middlesex Township.

SECRETARY'S REPORT.

No sickness of a contagious character in the township, and so far as I know it is in a very good sanitary condition, which the Local Board of Health will endeavour to maintain.

J. C. H. HERRON,
Secretary.

WELLINGTON.

Minto Township.

Owing to the sanitary condition of the Township of Minto being so good, it has not been necessary to take any extra precautions for the prevention of disease during this present year; the owners of the two slaughter-houses and the cheese factory, who obtained permission from this Board to use such buildings in carrying on their respective callings, seemingly have kept their premises in a proper manner, and no complaints of any kind have been made so far.

One of the great proofs of the healthy condition of this district is, that the number of deaths registered at the clerk's office for the present year is far below the average.

JOHN DARROCH,
Chairman.

MEDICAL HEALTH OFFICER'S REPORT.

In presenting my first annual report, as Medical Health Officer and Sanitary Inspector, I must congratulate you upon the excellent sanitary conditions existing in the township. It is true that during the past season there has been an unusual freedom from epidemic and contagious diseases, not due to any special precautions on the part of the Board or its officers, but which has been noticeable throughout most of the Province. Nevertheless, an endeavour has been made to comply with the provisions of the Public Health Act as far as it was possible to do so, and I have no doubt if there had been any marked violations of sanitary laws, endangering public health, energetic measures would have been taken to prevent them.

Under the circumstances I did not deem an extended inspection necessary, and therefore made none; but I visited the slaughter-houses within the municipality and found them kept on the whole very satisfactory. I did not consider that their condition was such as to impair the health of persons residing in their vicinity.

In conclusion, I am happy to be able to state that I am not aware of the existence of any remediable unsanitary condition in the township to which I could draw your attention.

W. A. HARVEY, M.D.,
Medical Health Officer.

PERTH.

Township of Mornington.

SECRETARY'S REPORT.

The Council of the Township of Mornington, on the 6th day of May, 1884, in accordance with the Public Health Act of 1884, appointed Mr. Jacob Kollman, Mr. Thos. Magwood and Mr. Thomas Armstrong, with the Reeve and Clerk, a Board of Health for

the Township of Mornington, and the same evening they met in the Village of Millbank on account of a son of Mr. Peter Livingston in that locality having the small-pox. Mr. Kollman was appointed chairman. The Board appointed Mr. James Magwood to go three times each day to two houses where the family lived and receive orders for anything they wanted, and the Secretary was authorized to have a notice put up at Livingston's gate, and to notify the Livingstons and a young man who had been with young Livingston's brother when he died, not to leave the premises where they resided until they had a certificate from a doctor that they were clear from any infection. I am sorry to have to report that young Livingston died with it, but no others took it, and I think there is no danger from it now. There have been some cases of typhoid fever in the township ; none but one has proved fatal, and that was a young man who worked in a cheese factory in the Township of Maryborough, and took the typhoid fever there and was brought home and died. I do not know of any infectious disease in the township at present. The Council have not appointed any Medical Health Officer or Sanitary Inspector. This report, therefore, cannot include the report of the Medical Health Officer.

JOHN WATSON,
Secretary.

Muskoka and Parry Sound.

Morrison Township.

CHAIRMAN'S REPORT.

The Local Board of Health elected by the Municipal Council, met according to the instructions of *The Act of Public Health* and organized.

The Act was read and every clause was discussed. The members were instructed how to proceed if any contagious disease made its appearance.

We did not appoint a Medical Officer or Sanitary Inspector, for we could not see any urgent necessity for them, and our finances would not allow us by any means to do so.

This township is small, and only one-third of this small area is settled, and the settlers living a good distance each from the other.

Our Muskoka highlands are very healthy, a salubrious bracing air and pure water must necessarily make it so, and our settlers, mostly immigrants from the old countries, are well educated and fully aware of the benevolent intent of the *Act of Public Health*, and also of its beneficial working, and will do all that is required to make it effective.

At our last meeting (November 18th) the report of the Secretary was read and adopted, and afterwards discussed at length.

The members intend to call meetings during the winter in their respective districts, and read and explain the Act to the people.

A. WIANAKO,
Chairman.

McDougall Township.

CHAIRMAN'S REPORT.

I have the honour of presenting to you the report of the Board of Health of this township.

Since the appointment of the Board thirteen nuisances dangerous to the public health, namely, three slaughter-houses and ten water-closets and cesspools in a very foul state have been removed, the same having been cleansed and disinfected and everything is being done to carry out the Act.

J. FARRER,
Chairman.

MEDICAL HEALTH OFFICER'S REPORT.

This, my first report of the sanitary condition of Parry Sound, must of necessity be brief, for since my appointment as Medical Health Officer, I am pleased to say that epidemics have been entirely unknown to us, and in fact I have been unable to trace a single case of sickness to a want of proper sanitary precautions. And now that we have an active and efficient Board of Health, I think we may rest in comparative security from the invasion of epedimic and contagious diseases arising from bad sanitary conditions, or if we are so unfortunate as to be visited by an epidemic we will at least feel certain that everything it is possible to do to prevent its spread will be done. But I hope you will not infer from this that there is nothing for you to do, or that our sanitary condition is perfect, for such is by no means the case ; for although my attention has not yet been called to any violation of the sanitary laws, yet when I think that there are about three or four hundred privies in our village and almost an equal number of wells that the water cannot escape contamination to a greater or less degree, and I cannot too strongly condemn this method of disposing of the excreta, especially when the water supply is wholly from wells, and I hope before long that we will be able to dispense with privies altogether, and have instead the ash closet, which I think could be managed at a trifling cost, and thus avoid all further risk from that source. Before closing my report, or rather apology for a report, I wish to express my approval of the prompt action taken by the Board of Health in attending to the sanitary condition of the slaughter-houses, and also to the removal of excreta and many other things they have promptly attended to. I also wish to congratulate the people of Parry Sound on the erection of such a handsome and much needed school-house, for besides being a large, commodious, well-ventilated building, it is a credit to our village and a place were children may be sent without endangering their health, and where their minds may be more readily cultivated.

GEORGE FIERHELLER, M.D.,
Medical Health Officer.

MIDDLESEX.

Township of McGillivray.

SECRETARY'S REPORT.

The Municipal Council has appointed neither a Medical Health Officer nor a Sanitary Inspector, and under these circumstances what is the duty of the Board ?

No places detrimental to the health of the inhabitants in any district of this municipality have been reported to this Board, nor have any infectious diseases been prevalent in any part thereof.

By section 28 of *Public Health Act*, is it expected that the whole of the municipality is to be minutely inspected, or merely to be inspected if any nuisance is reported to exist ?

This Board desires to make as complete a report as far as their knowledge extends, and are anxious to comply with the requirements of the Act to the best of their ability, and any suggestions you will send them will be thankfully received.

WILLIAM FRASER,
Secretary.

MUSKOKA AND PARRY SOUND.

Township of McKellar.

In reply to your circular of October 20th, I have the honour to report that the Local Board of Health for the Township of McKellar for 1884 started with a well defined

policy of doing nothing, and up to the present time every member has carried the policy out to the fullest extent possible. I have not succeeded in getting the members together to select a chairman.

G. B. LEE,
Local Board of Health.

Townships of McLean and Muskoka.

SANITARY INSPECTOR'S REPORT.

According to orders received from the local Board of Health, in August, 1884, I inspected every house and yard in the hamlet of Bayville. I recommended every one to use sulphate of iron for privies, chloride of lime and carbolic acid for rooms, cellars, and yards. In the house occupied by Henry Budd, I found four sick with low fever, and destitute of proper food. The house and premises emitted a stench day and night. As there was danger of Typhoid fever, I had the family removed and supplied with proper necessaries. They are now well.

ANDREW SLEMMONT,
Sanitary Inspector.

RENFREW.

McNab Township.

SECRETARY'S REPORT.

In accordance with the requirements of the "Public Health Act, 1884," I beg to report,

1. *As to the work done.*—I have procured a minute book for the Board, and I have got a supply of bills or cards printed, as required by rule 4, of section 17, of schedule A to the said Act. About the 30th of October last, I was informed by Dr. Ward, of Arnprior, that Diphtheria was in three houses in the village of Braeside. I immediately went there and posted notices on the houses in which the disease was, and told the people to leave the notices up until the physician told them to take them down.

The above is a brief statement of the work done since the Board was formed.

2. *As to the sanitary condition of the Municipality.*—I have to report that, so far as I know, it is excellent, and has been so ever since the formation of the Board. The only cause of alarm was the cases of Diphtheria mentioned above—and only one of them was considered to be a serious case—and I received no hint that its appearance was considered due to any local cause whatever.

A. HAMILTON,
Secretary.

WELLINGTON.

Nichol Township.

SECRETARY'S REPORT.

In compliance with your circular of the 21st October last, I have the honour to transmit the following report of the proceedings of the local Board of Health, in this municipality, during the current year:—A meeting of the Board, at which all the members were present, was held on the 9th of June, being the second Monday after the members who were not members *ex officio*, were appointed: at this meeting it was considered inexpedient and unnecessary (at that time, at least) to appoint a Medical

Health Officer or a Sanitary Inspector for the municipality, but resolved that each member of the Board should respectively endeavour to ascertain the sanitary condition of his locality, and endeavour to have any nuisances removed which might be considered dangerous to the public health, and that the chairman should call a meeting of the Board, if any emergency should at any time occur, when he might consider it necessary to do so. As the general health during the past summer, in this locality, has been very good—no epidemic of any kind having prevailed, no special meeting was called. The chairman called an ordinary meeting of the Board to be held on the 25th inst., in order that the Annual Report be prepared for transmission. All the members attended and reported favourably of the general health prevailing in all parts of the municipality. The questions found on page 148 of the second Annual Report of the Provincial Board of Health were duly considered, and the answers to the said queries decided on, and the secretary instructed to transmit them to the Provincial Board at Toronto. I have, therefore, in accordance with such instructions, transcribed the answers agreed upon according to their respective numbers on the next pages.

JAMES McQUEEN,
Secretary.

OXFORD.

East Nissouri Township.

SECRETARY'S REPORT.

Our municipality being an entirely rural one, we are free from the evils of overcrowding, and it is the interest, as well as the duty, of all our neighbours to do their best to preserve the health of their several households. We fully recognize and appreciate the benefits likely to accrue from the establishment of Boards of Health, both local and provincial, and will be at all times prepared to take the necessary pains to attend to all matters appertaining to the public health within the limits of our municipality, and to do our duty so far as we understand it. We feel greatly the need of a supply of printed matter, consisting of short essays on the various branches of hygiene which should be treated in a popular manner, for general distribution, and would suggest that such essays should be printed under the direction of the Provincial Board, and furnished in liberal quantities to local boards, with request to the secretaries to distribute the same to leading men in their several municipalities. We feel that no money can be more profitably employed than in thus promoting the enlightenment and improving the health of the community. We observe with pleasure that a very considerable amount of tile-draining is being done in this section, and although done entirely for agricultural reasons, it must undoubtedly prove very beneficial hygienically. In conclusion I would say that we have had every reason to be thankful for the very good state of public health that has been enjoyed during the present year, including an almost complete exemption from contagious, epidemic, or endemic diseases within the limits of this municipality.

CHAS. R. COMMANDER,
Secretary.

GREY.

Normanby Township.

SECRETARY'S REPORT.

We have a local Board of Health, and it is actively engaged in matters relating to the public health. Peter McLean, M.D., (as previously reported) is the appointed Health Officer. He is not a salaried official.

Several complaints against nuisances were received and investigated by the Board. Nuisances had to be abated or removed. Privy-pits are generally employed in the disposal of excreta, which is often removed on account of its value as manure for the farm. Privies in the country are not much frequented, and always a good distance from wells, situated so that no disease can be traced to their presence. The chief source of our water supply is clear springs and wells, and such supply is not affected by excreta and other refuse, by pollution of streams and rivers, or privy-pits and soil pollution. Stagnant water exists to a very small extent. No cases of disease from contamination of drinking water came under our observation. Our Medical Health Officer reports as follows: "There have been no epidemics in this township this year. We have had no Small-pox, Scarlet Fever, Measles, Diphtheria, Whooping-Cough, or Typhoid Fever."

GEORGE HOPF,
Secretary.

OXFORD.

Norwich South Township.

SECRETARY'S REPORT.

In accordance with Section 24 of *The Public Health Act of 1884*, I beg to lay before the Board for its consideration the following report:

There has been received from the Provincial Board of Health its second report, also circulars, letters, etc., urging upon the Local Boards of Health the necessity of carrying out the provisions of the said Act. The Local Board of Health for this municipality has only had one complaint of a nuisance, which was occasioned by stagnant water in the village of Otterville. The party owning the property when notified of the nuisance had it removed forthwith.

I would beg to state for your information that the health of the public generally has been good for this year. The number of deaths registered in the municipality has averaged forty-five each year for the last four years. For this year up to date, the number registered has been twenty-five.

JOHN COOPER,
Secretary.

CHAIRMAN'S REPORT.

In the discharge of my duties as Chairman of the Local Board of Health for this municipality, as prescribed in Schedule A, Section 69, of *The Public Health Act of 1884*, I present for your consideration this, my first annual statement of the work done by the Board during the year, which, I must say, has been *nil*, owing, I think, to the want of a Medical Health Officer or Sanitary Inspector.

My knowledge of the sanitary condition of the municipality extends no further than my duties as a physician, and as this report should embody the report furnished me by the Medical Health Officer must of necessity, be incomplete.

In so far as I know the health of the people has been better than some preceding years. Only three cases of Intermittent Fever have come under my notice during this year, some four cases of Scarlet Fever, many cases of Whooping-Cough and Measles; no Diphtheria, no Small-pox or Typhoid Fever. In the southern part of the township where the water supply is mostly surface, there have been quite a large number of cases of Remittent Fever. The clearing and draining of many of these lands, now in active progress, cannot but lessen the prevalence of this and kindred diseases.

I am fully satisfied that a Local Board of Health actively engaged in carrying out the provisions of *The Public Health Act*, will be the means of lessening disease, thereby increasing the happiness and wealth of our citizens.

In conclusion, I wish to say that if it devolves upon the Local Board of Health to appoint a Sanitary Inspector for the coming year, due consideration should be made as to the fitness of the person undertaking the duties of that office, as he will have no sinecure.

A. J. COLLVER,
Chairman.

FRONTENAC.

Olden Township.

CHAIRMAN AND SECRETARY'S REPORT,

The Board having learned that Small-pox was in the neighbourhood of Tweed and other places to the west, after consulting the statute in that behalf, it was moved by Mr. Flynn, seconded by Mr. Coulter, and resolved :—That the Chairman and Secretary proceed to employ Dr. Finney, of Arden, Township of Kinnebec, and he be directed to proceed with vaccination in this township.

Moved by Mr. Price, seconded by Mr. Coulter, and resolved :—That the following places be named or appointed for the inhabitants to meet said Dr. Finney, viz. :—Mountain Grove, R. Flynn ; Long Lake, Mr. Bender ; Coulter neighbourhood, J. Coulter, Jr. ; Lyon neighbourhood, Wm. Lyon ; Oso Line, Joshua Coxe.

JAS. SANDERSON, Chairman.
JNO. D. PRICE, Secretary.

SIMCOE.

Orillia and Matchedash Township.

SECRETARY'S REPORT.

As it is required by section 24 of *The Public Health Act, 1884*, that the Secretary of each Local Board of Health should draft an annual report of the sanitary work done during the year, and of the sanitary condition of the municipality, I have great pleasure in being able to congratulate you on the small amount of actual work that has been required of you during the present year.

So far, I am happy to report that there has been no case of any contagious disease of any kind reported to me as having occurred in your district, either by the members of the medical profession, or by the several members of the Board who were appointed as Sanitary Inspectors under by-law number 178 of your municipality ; and in the few cases of nuisances that were brought to the notice of the Sanitary Inspectors, they were at once remedied by the offending parties as soon as notified by those officers.

The several amendments to the general by-law, Schedule A (advised by you at your last meeting), and your proposal to divide the municipality into sanitary districts under the special supervision of the member of the Board residing in the same, were at once assented to by the Municipal Council, and a by-law introduced and passed confirming your various suggestions. I have also great pleasure in being able to congratulate you on the sanitary condition of this municipality, which is quite satisfactory as far as has been reported to me.

No individual Health Officer having been appointed by you, I am unable to submit his report, as required by section number one, Schedule A.

ALBERT FOWLIE,
Secretary.

SIMCOE.

Township of Oro.

MEDICAL HEALTH OFFICER'S REPORT.

During this year, as during every other year for the last ten, the Township of Oro has been practically free from the influence of malaria, the subtle poison that in so many parts of Ontario depresses the energies of the people by fevers and by general unhealthfulness. So, too, it has been all but free from Phthisis—a disease which, as a death factor, heads the lists in all countries within the temperate zone. The cause of this immunity is not far to seek. Dampness of soil and Consumption stand to each other in the direct relation of cause and effect. This is no longer a theory,—it is a fact as well established as that the decomposition of vegetable matter in the presence of heat and moisture, is the cause of malarial diseases. Oro being elevated one to two hundred feet above Simcoe Lake level, having in its northern third an exceptionally porous soil, sandy, and with but little organic matter to undergo changes in it, and having as a rule good natural drainage in the rest of its extent, escapes that soil saturation which adds so largely to the mortality elsewhere. Typhoid and Scarlet Fevers, the diarrhœal group, Pneumonia, Bronchitis, and Diphtheria are all with us mild in type and of exceptionally low mortality. Mild epidemics of the contagious diseases having a tendency to become malignant chiefly as they affect those with unhealthy surroundings, our epidemics remain as a rule with but little inherent death tendency.

During this year but one epidemic has prevailed to any considerable extent in our township. The disease in question was Mumps, and the epidemic was peculiar, in that fully one-half of all the cases occurring in our sex manifested that untastatic or wandering tendency which, in the ordinary lay mind, is the cause of so much dread as to impair future usefulness.

The thorocic diseases were, as usual, very prevalent in March and April, and Pleurisy with effusion was quite exceptional in the frequency of its occurrence. The abdominal diseases, attended by Diarrhœa, were late in manifesting themselves, and only reached their maximum in October.

All sanitary measures being based upon vital statistics, the reports on births, marriages and deaths issued by the Ontario Government are valuable publications. To possess our confidence, statistics of this kind must be reasonably complete. The Ontario system for their collection is doubtless a good one, but I have reason to know that all, or nearly all, the deaths are not reported under it. Not a few physicians make no death returns at all, and do not mean to make any till compelled to do so, or till paid for so doing. As this is one of the perhaps too few points in which your Medical Health Officer is without sin, he feels disposed to bring it up here. As a suggestion, if the blanks (Schedule E) now supplied for the use of medical practitioners in the registration of deaths were printed on stiff paper in the form of double post cards, hinged at the end and provided with flap; if, also, they were marked "For Registration, Free" in the position where a stamp is ordinarily affixed, and had printed on them the penalty for non-compliance with the law in respect to the registration of deaths, I believe this duty would be less neglected, and the value of the facts collected would be correspondingly increased. This plan (which is similar to that adopted by the very efficient Secretary of the Ontario Board of Health, in collecting weekly reports as to the health of various sections of the Province), would reduce to a minimum the work required from the medical attendant, and would put a stop to the pilfering by Government of the doctor's stationery. I wish to suggest, also, that a report to this Board by its Secretary, who is the Registrar of vital statistics for this district, showing the number of deaths in each of the ten highest causes of death, with other facts, would be of interest, and might be published in the local papers, as the reports of the meetings of the Township Council are. The Ontario report gives statistics by counties but not by townships. For one thing, a report such as that suggested would, in my opinion, establish the fact that the township in which we live is one of the safest spots in Canada for the residence of those with Phthisical tendencies.

Since in some of the larger cities *one-half* of all the inhabitants are more or less tubercular (example, Boston; authority, Dr. O. W. Holmes); and since in Ontario this percentage of deaths due to Phthisis is increasing, such a fact, if established, could not fail of being valuable. In different counties of Ontario the percentage which the death rate from Consumption bears to the total death rate will vary from five to seventeen per cent. For the whole Province it was, in 1882, 11.3 per cent. With us, taking one year with another, I am strongly of the impression that it does not reach three per cent.

Doubtless the hardy race from which the first settlers of Oro sprang, transmitting to their descendants no tubercular taint, should receive a part of the credit for our comparative freedom from tubercular disease. Some, it is said, "are born to Phthisis, some acquire Phthisis, and some have Phthisis thrust upon them." The cases seen by the writer here have almost entirely belonged to the second class, and have resulted from neglected colds, from exposure, or from causes of that nature.

N. A. POWELL, M. D.,
Medical Health Officer.

GREY.

Osprey Township.

SECRETARY'S REPORT.

The Local Board of Health of the Township of Osprey, in presenting its first annual report, is thankful to have to report that the sanitary condition of this municipality throughout the year has been uniformly good.

That in some cases the Board ordered the removal of animals confined too near dwelling-houses, and the thorough cleaning and disinfecting of the premises, which were promptly complied with.

This Board has not appointed any Health Officer.

There have been no cases of Small-pox, Scarlet Fever, Measles, Diphtheria, Whooping-Cough, or Typhoid Fever in this municipality during the year passing.

No precautions are taken in regard to isolation, disinfection of clothing, etc., but as there has been no cause, no reduction.

About one-eighth of this municipality consists of marsh or swamp, partly covered with stagnant water.

There are now no nuisances such as neglected slaughter-houses, etc., in this municipality.

WM. MILNE,
Secretary.

OXFORD.

Oxford East Township.

SECRETARY'S REPORT.

We have a Local Board of Health in this township, but nothing has been done beyond organizing and getting ready for work. No diseases of an infectious or contagious nature have come amongst us, and our township is in a good sanitary condition.

JAMES G. PETTIT,
Secretary.

OXFORD.

Oxford North Township.

SECRETARY'S REPORT.

The objects engaged in by the Board have been to enforce the provisions of the By-law in reference to slaughter-houses, and the inspection of cheese-factories. Complaints having been made to the Board that the slaughter-house situated on lot No. 11, 3rd concession, was kept in a filthy state, said slaughter-house being surrounded by dwelling-houses, the Board directed the Inspector to visit the premises and report to the Secretary of the Board, which was done. The parties were ordered to discontinue the slaughtering of animals on the premises for the future. The Board also ordered the Inspector to visit the other slaughter-houses and cheese-factories in the township and report to the Secretary. The Inspector reported as follows: Having visited the slaughter-house owned by Joseph Cann, ordered the same to be removed to the distance required by the By-law and be kept clean; visited the slaughter-house owned by James Gleeson, and found the same in a very dirty state; ordered the removal to the proper distance as required by the By-law, and to be kept clean; visited the cheese and butter manufactory on lot No. 13, 2nd concession; found everything inside clean and satisfactory, but the drain outside the premises in a filthy state, caused by the refuse from the factory; visited the cheese-factory on lot No. 1, 5th concession, and found everything inside clean and satisfactory, but the drain outside in the same state as the other factory.

A. HILLADON,
Secretary.

RENFREW.

Petawawa Township.

SECRETARY'S REPORT.

This township is poorly settled, and the settlers live very scattered, in consequence our Board has not much work. We have not a Sanitary Inspector or Medical Health Officer, and the sanitary condition was during eighteen years a very fair one.

PAUL DANNHAUER,
Secretary.

WELLINGTON.

Township of Pilkington.

SECRETARY'S REPORT.

The first meeting of the Board was held on the 9th day of June. All the members present. As there was no sickness of any kind in the township, it was decided not to appoint a Health Officer or Sanitary Inspector at present.

The second meeting was held on the 25th of November. All the members present, who reported that there were no cases of sickness in any part of the township at present, and there had been no cases during last summer; it was not considered necessary to appoint any Health Officer or Sanitary Inspector before the meeting of the new Board, and it may not be required then if the township continues in the same healthy condition.

ROBERT CROMAR,
Secretary.

FRONTENAC.

Pittsburg Township.

SECRETARY'S REPORT.

In conformity with the directions of the Public Health Act, 1884, the local Board of Health of the Township of Pittsburg beg leave to report as follows: That at their first meeting it was thought advisable to sub-divide the municipality into four divisions for the purpose of inspection, each member to take charge of the division in which he resided, the members to report at each meeting the sanitary condition of the division under his supervision; and in accordance with the Act, and resolutions adopted, we have performed the work, and may remark that we have found the township to be in a clean and healthy state, so that it was not necessary to appoint a Medical Inspector.

CHARLES BELWA,
Secretary.

LAMBTON.

Plympton Township.

SECRETARY'S REPORT.

I have to report that although there is a Local Board of Health in this municipality, yet it is in an inactive condition. Know of no diseases which can be traced to the closeness of privies to wells, but cannot say at what distances they are placed asunder. No cases of Small-pox, Scarlet Fever, Measles, Diphtheria, Whooping-Cough, or Typhoid Fever. I am sorry I could not reply to your circular sooner, but it was hard to get all the members of the Board together. I hope the above will be sufficient.

J. R. K. SCOTT,
Secretary.

GREY.

Proton Township.

CHAIRMAN'S REPORT.

I have the honour to present the report of the Local Board of Health and beg to state that we have made little progress beyond the appointment of the members and the organization, as no Medical Inspector was appointed by the Council. We arranged that the members should act in their localities as they deemed best to carry out the provisions of the Act—cards, etc., being procured for distribution, as necessity might arise. I am happy to state that there has been no call for united action to contend against any special disease up to the present date. The health of the community has been good. The police-village of Dundalk, which, from the location, might be subject to miasmatic diseases, has been exceptionally free from such, arising, I have no doubt, from the system of drainage just completed through and around it, and the exertions of the police trustees in enforcing sanitary precautions in the village, thereby removing all fear of endemic disease. This satisfactory state has been attained by the spirit exhibited by the inhabitants in taxing themselves for such beneficial purposes. We hope in time the example will be followed throughout the township when the people come to appreciate the benefits of Hygiene, as, from a sanitary point of view, we are in a primitive state.

PETER McGREGOR,
Chairman.

HALDIMAND.

Rainham Township.

CHAIRMAN AND SECRETARY'S REPORT.

The condition of this township is now, and has been for the year past, very healthy, and such being the case we did not see the necessity of forwarding the questions and answers on page 148 of the Second Annual Report. We have no Medical Health Officer appointed as yet. Hoping this will be found sufficient for all the purposes required by you, we have the honour to be,

EDWIN HOOVER, Chairman.
R. A. HAVILL, Secretary.

KENT.

Raleigh Township.

SECRETARY'S REPORT.

The Local Board of Health of this township has not done much specific work since organization. There is a Medical Health Officer in connection with the Board. I have not the slightest doubt but that wells are contaminated in many cases from their too close proximity to outhouses and other sources of pollution. Scarlet Fever, Whooping-Cough, and Measles have been prevalent in some parts, but have not been reported to this Board. There has been one case of Diphtheria reported. Majority of the people have no idea of isolation, it being considered very unfriendly by many not to call, no matter what the disease in the family may be. Sanitary education will have to be resorted to by the Board in order to do away with this and many other queer ideas.

J. G. STEWART,
Secretary.

ONTARIO.

Reach Township.

CHAIRMAN AND SECRETARY'S REPORT.

As a Medical Health Officer or Sanitary Inspector for the township has not been appointed by the Council, the Board is not in a position to report as fully on the sanitary condition of the township as if such officers were appointed and in a position to report on the same ; but from the general knowledge of the members of the Board, through residing in different parts of the township, they are able to say that the general sanitary condition is good, at least so much as can be expected in a rural municipality, but will be much better when the provisions of the Health Act are more fully known and better understood.

That for the purpose of the provisions of the Health Act being better known, the Board would recommend that a sufficient number of copies of the *Public Health By-law* be printed, or procured, so that one copy thereof can be left with or sent to each householder in the township, and that your assessor to be appointed for the ensuing year be instructed to deliver such copies at the time he is making his assessment.

They would also recommend that you pass the By-law mentioned as schedule B to the said Act, being a By-law respecting the Public Health By-law.

JOSHUA DOBSON, Chairman.
JOHN CHRISTIE, Secretary.

ESSEX.

Rochester Township.

SECRETARY'S REPORT.

The Local Board of Health for this municipality was organized on 26th of May last, but as the township has been free, with but few exceptions, from contagious or infectious disease, little has been done beyond organization. No Medical Health Officer has been appointed. No by-law has been enforced with respect to the disposal of excreta or privies, many of which are far too close to wells, the water of which is used for drinking and other domestic purposes, and far too little consideration is given to our water supply. There have been two cases of Diphtheria and one of Whooping-Cough reported. No Typhoid cases have been reported, but I am afraid there have been some. At last meeting I called the attention of the Council to the necessity of passing a by-law for the appointment of a Medical Health Officer, in order that the health of the municipality would be systematically looked after and diseases properly reported, and, if necessary, measures taken by him for their prevention or isolation.

P. J. FREEMAN,
Secretary.

RENFREW.

Township of Ross.

SECRETARY'S REPORT.

Your letter of the 2nd came to hand, and in accordance with the same I called a meeting of the Board for this township to meet in Cobden. They met, and as they reside in different parts of the township they had a better chance of knowing if any disease prevailed within the bounds of the township. There is no disease, nor has there been any for the past summer; therefore they made no report, nor has the Medical Officer made any to the Board. I received a book, headed "Notes of the Inspection of Premises," which seems to be for towns and cities. If you have any blank forms for township, send me some, as this is a new law, and we here in the woods are ignorant of the duties of the office; and if you would give us any information on the subject, it would be very favourably received.

JOHN REYNOLDS,
Secretary.

MUSKOKA AND PARRY SOUND.

Township of Ryde.

SECRETARY'S REPORT.

In accordance with the *Public Health Act, 1884*, sec. 24, I beg to report the sanitary condition of this township as really good.

At present time I do not know of one case of sickness. There have been no Zymotic diseases during the year, and, as the Chairman says, there is literally nothing to report except that our people are all well.

A. C. FLETCHER,
Secretary.

Township of Ryerson.

CHAIRMAN'S REPORT.

I have the honour of presenting to you the report of the Board of Health of this township for 1884.

Since the appointment of the Board there have been no cases requiring the action of the Board. The sanitary condition of the township is very fair.

ANDREW STARRUT,
Chairman.

ESSEX.

Sandwich, West, Township.

In regard to the report of the Local Board of Health appointed for this municipality, I have to tell you that I have inquired of the other members, and we thought that it was not absolutely necessary to meet except on account of disease, and as we have had no disease of any kind this year, even if we had met we would have no other report to make; but if you say that we should meet, I will notify the Board at once, and send you the result.

DENIS ROCHELEON,
Township Clerk.

BRUCE.

Township of Saugeen.

SECRETARY'S REPORT.

As a Board of Health officer I am glad to report there have been, so far as I can learn, no infectious or contagious diseases in this municipality since the Board was organized. The return of deaths since 1st July consists of one case of each—Apoplexy, Dropsy, Pneumonia, Diabetes, Senectus, 86 years—five in all.

ROBERT B. FLEMING,
Secretary.

YORK.

Scarboro' Township.

MEDICAL HEALTH OFFICER'S REPORT.

There is no township in this county that is better informed upon the subject of sanitary science than our own, and if each individual acted up to the knowledge that he has of this important subject there would be a far better condition of health prevailing throughout this community. In conversation with all classes of people, I find that their neglect of sanitary regulations arises not from ignorance of the organic laws, but from sheer recklessness regarding the most important interests of life.

The law of health, therefore, which has recently been made applicable to our municipalities, is simply the crystallization of public opinion which already existed in our

midst, and every intelligent man feels the necessity for the rigid enforcement of all the provisions of the enactment.

Therefore, I have endeavoured, to the best of my ability, to discharge my duty as a servant of the law as well as of this municipality. I have made a careful investigation of the hygienic conditions of this township, and find that our polluted wells, foul cisterns, defective drainage of cellars, and stagnant pools, arise from false notions of economy, and not from ignorance of the deleterious effects of the same.

Complaints have been made to me from different persons, which I am convinced have been well founded, that the ill-health of their families has arisen from impure water supply, as well as imperfectly drained cellars; and the parties being tenants their grievances have been unheeded by their landlords, and consequently remained unredressed.

You are well aware that the general concurrence of medical opinion at the present time points to specific germs as the sole cause of Typhoid Fever, Diphtheria and Scarlet Fever, etc. And that the universal experience of the medical profession goes to prove that most epidemic diseases are the result of defective drainage, impure air and the germs of disease carried by water from privies, water-closets and cess-pools into wells and other means of water supply.

How important then that the sources of drinking water should be absolutely pure, for water contaminated with these germs may look as pure as ever, and taste as cool and refreshing, and yet contain the seeds of disease.

It therefore behoves us that we, acting in accordance with the best medical opinion of the day, should see that the provisions of the law regarding the cleaning out of wells and thorough drainage of cellars be enforced.

Our Sanitary Inspector has exhibited a praiseworthy zeal in the discharge of the duties of his office; he has done much, but much more remains to be done. It would be well if he should take a general survey of our township, and find out by careful inspection whether the law is generally recognized, and to impress upon the delinquents the necessity of obedience.

A motion was passed by the Board that I should inspect the sanitary condition of the schools, and I must say that in most of the sections we may well feel proud of the capacious structures that have been fitted up with every regard for the comfort and convenience of our children.

What is most needed is the adoption of a uniform system of heating and ventilation. I would recommend Ruttan's Ventilating Heater as the most economic and effectual mode of warming an ordinary school-room. There is one in School Section No. 5 that has been in use for thirteen years, and Joseph Latter, Esq., teacher of the above school, says it only takes five cords of hardwood a year to keep a room 33 feet by 55 feet comfortable. The same school is protected by lightning rods, which gives pupils a sense of security during a thunder storm which they otherwise would not feel. Among the many methods of ventilation I prefer the galvanized perforated tube, extending from front to rear of every room and near the ceiling. By these means of heating and ventilation we avoid draughts, and reduce the impurities in the air of the school-room to a minimum, and obtain the most regular temperature possible for the expense incurred. Of course the hot-air system is becoming popular, but its cost interferes with its general use.

I cannot pass without referring to the water supply of our schools. In some sections they have no water at all, in others it is abominable. They say what is everybodies business is nobody's business. It is every parent's business to see that their children have good water, and yet our school children are obliged to drink filthy water, or depend on the neighbours for their supply. I ask you is it necessary that the trustees of schools in a wealthy township like Scarboro' should oblige our children to go begging for water?

In conclusion I would remark that the general sanitary condition of our township has been anything but good, Scarlet Fever has been prevailing in the north-east, and Typhoid Fever in the south-west for several months; there is, consequently, an urgent necessity that our health law should be strictly enforced.

L. D. CLOSSON, M.D.,
Medical Health Officer.

ELGIN.

Township of Southwold.

SECRETARY'S REPORT.

I cannot furnish you an elaborate report of the working of the Local Board of Health of the Municipality of the Township of Southwold, as the public health has been in general good. Scarcely any contagion in said municipality since the Local Board was organized; only two cases of Typhoid, one in the extreme western part of the township, and the other in the north-east part, both cases are steadily recovering. The Local Board in a body made an inspection of all the slaughter-houses and cheese-factories on the 15th day of last July, and generally found them in a bad sanitary condition, but since they were all cleansed and placed in better condition; but there remains much active work to be done, particularly in villages, as the people are very careless about keeping their dwellings and surroundings in a proper sanitary condition. The Local Board is so appointed as to place one member in each ward of the township, and each looks after his own ward, and acts as Inspector in his ward. In some of the wards several visits have been made of inspection. There is no doubt but the case of Typhoid referred to in the western part of the township was caused by a cesspool or an old cellar, full of stagnant water for years, in the immediate vicinity of the case. I fear that the greatest trouble in the way of working the Act successfully will be the lack of moral courage of members doing their duty for fear of offending some persons, but that should not be allowed. Local Boards in the interest of the public health should be compelled to do their duty as required by the Act.

M. CAMPBELL,
Secretary.

RENFREW.

Township of Stafford.

CHAIRMAN'S REPORT.

The Board of Health of the Township of Stafford have met once, and have agreed to adopt all the clauses submitted by the Provincial Board of Health, except Rules 10 and 11.

We have not got any report from the Medical Health Officer yet as to the sanitary condition of the township. So far as we are aware, there has been no disease dangerous to public health during this year.

HENRY CHILDERHOSE,
Chairman.

WELLAND.

Stamford Township.

SECRETARY'S REPORT.

In accordance with instructions from the Provincial Board of Health, dated Toronto, October 21st, 1884, the Secretary of the Board of Health for the Township of Stamford begs to submit the following:

We have a Local Board of Health duly organized and ready to take action if necessary, but from the healthy position of the municipality, no complaints were made to any member of the Board by any of its inhabitants, consequently nothing was done.

JOHN A. ORCHARD, Chairman.
F. A. HUTT, Secretary.

VICTORIA.

Township of Stanhope and Sherbourne.

SECRETARY'S REPORT.

In compliance with your request of the 21st ultimo, I called the Local Board of Health together to ascertain what had been done. The report was nothing; no cause for action, only what I had done myself, which was to cause the spring supplying water for school section No. 2 to be cleansed and properly taken care of; also, one case of Scarlet Fever, the precautions taken with which prevented its spreading.

JAMES MELVILLE,
Secretary.

HURON.

Township of Stephen.

SECRETARY'S REPORT.

We have a Local Board of Health here, but as yet they have not exhibited sufficient energy.

I shall give privy.pits and wells greater attention. I am strongly of the opinion that the well and privy of a certain school-house in this township are on too neighbourly terms or proximity, not being more than about thirty feet apart, and not removable nor ever cleaned out. Every fall the said section is affected with Croup, Diphtheria, Dysentry, Typhoid Fever, etc. Whooping-Cough and Typhoid have been very prevalent, some of the latter proving fatal.

Steps are being taken to cause slaughter-houses to comply with sanitary regulations.

A large drain has reclaimed a large tract of land.

C. PROUTY,
Secretary.

MUSKOKA AND PARRY SOUND.

Township of Stephenson.

SECRETARY'S REPORT.

A Local Board of Health has been organized, but it is not active, and has not appointed a Medical Health Officer. Privy-pits are allowed to go on as usual, nothing being done to ascertain whether they are in a filthy condition or not. I believe the water in the wells is not very much affected by privies. General health is good.

DANIEL BAIN,
Secretary.

Township of Stisted.

SECRETARY'S REPORT.

The Local Board of Health met at the Orange Hall, Stisted, November 20th, to report on the sanitary condition of the municipality. Their report shows that there has been no cause of complaint throughout the township, and that the municipality is in a

very healthy state, there being only three deaths in the township for this year, and the causes are one of dropsy, one of general debility, one of inflammation. The population of the township is 686.

THOS. LAKEMAN,
Secretary.

Township of Strong.

CLERK'S REPORT.

I am in receipt of your circular of October 21st, and in reply would say that I have repeatedly laid this matter before the Council, but no action has been taken in the matter. Of course this township is but newly settled and not so liable to be visited by any scourges or plagues as one more thickly populated, but still there is nothing like being forearmed for a visit of any of these epidemics. I also suggested a union of the Townships of Armour and Strong to be formed into a health district, and I believe if the Township of Armour had moved in the matter our Council would have also have taken some steps, but as yet the matter lies dormant. If you think it advisable that we should organize please write me at once and I will again lay it before the Council on the 16th December. You might also write the Clerk of Armour, as I believe the two municipalities can be worked more cheaply jointly than separately.

G. E. GIBBON,
Township Clerk.

SIMCOE COUNTY.

Sunnidale Township.

CHAIRMAN AND SECRETARY'S REPORT.

Our population is about 2,650, mostly farming or at lumbering, etc. The health of the municipality has been exceedingly good and very little disease for the past season, for which mercy we feel devoutly thankful; and therefore the Board has not been called upon to use active measures.

There are no slaughter-houses in the municipality.

The Medical Health Officer having never been called on as such, has no report to present for this year.

It is desirable that the Provincial Board send the Local Secretary a printed form of report which would exactly contain the items most useful and interesting to report on to the General Board.

ROBERT PATON, Chairman.
GEORGE BURROWS, Secretary.

GREY.

Sydenham Township.

CHAIRMAN'S REPORT.

The members appointed by the Township Council at its session held on the 9th day of September, 1884, are William Johnstone, Donald Baxter, and Martin Cathua.

The members of the Local Board of Health met on the 22nd day of September, and the Board was organized by electing William Johnstone, Chairman.

The Board passed a resolution instructing the Secretary to have a number of the necessary notices printed in case of their being required.

The Secretary was instructed to notify the medical men practising in the municipality that they can obtain the necessary forms on application to him.

The Board, not being cognizant of any contagious disease in the municipality, have deemed it unnecessary to make any further provision at present, the time for the appointment of members for next year being so near at hand.

There being, as far as the knowledge of the Board is concerned, no contagious disease prevailing in the township during the year, I am happy to be able to report that the sanitary condition of the township is very satisfactory.

WM. JOHNSTONE,
Chairman.

WELLAND.

Township of Thorold.

SECRETARY'S REPORT.

This Board was organized on the 10th day of July last, and caused one hundred copies of the By-law to be printed and distributed throughout the township, and immediately afterwards proceeded on a tour of inspection throughout the municipality, in accordance with the Act. We inspected three slaughter-houses, issued permits for two, the third we found to be in an unsanitary condition; we forbade the parties interested from using it for slaughtering purposes, and to remove the building to a lawful distance from dwellings and roads, and also to remove the rubbish which had accumulated around the building, and to plow up the ground, using disinfectants; and for neglecting to comply, information was laid before a Justice of the Peace, the owner of the building was fined ten dollars and costs, and the occupant five dollars and costs. They afterwards complied with the law, and a permit has been granted for said building to be used as a slaughter-house. Otherwise we found the township in a good sanitary condition which at the present time exists. The Council of this municipality did not appoint a Medical Health Officer, but our Board has a physician a member of the Board, and he was appointed one of the Sanitary Inspectors of this Board.

PHILIP S. MUSSEN,
Secretary.

KENT.

Tilbury East Township.

SECRETARY'S REPORT.

I have the honour, pursuant to the provisions of Section 24 of *The Public Health Act, 1884*, to report as follows:—

1. As regards sanitary work done during the past year, I regret to say that very little indeed has been done. Blank forms on which to report certain diseases dangerous to the public health, were, as required by Section 17, Rule 1, of Schedule A, to the said Act, early in the season mailed or delivered to each medical practitioner practising within the township, but up to the present date only one case of Scarlet Fever, and one case of Diphtheria, have been reported to your secretary. From other reliable sources I am aware that many families, chiefly living in and around the Village of Tilbury Centre, have been visited by Diphtheria, and that no fewer than seven deaths from that disease have occurred in the township within the last four months. The absence of any report by the attending physicians, in so many instances, is much to be regretted, as implying a certain apathy in regard to sanitary matters in a quarter where it was least expected. I am satisfied,

however, that the Board have only to bring this matter more prominently to the notice of our local physicians in order to obtain their valuable assistance and co-operation.

2. *Sanitary Condition of Municipality.*—In this connection, so far as I am able to judge, the two great evils which confront your Board are Ignorance and Carelessness. As an effectual means of meeting the former evil, I beg leave to suggest to your Board the free and liberal distribution, amongst the people generally, through the municipal assessor or collector, of the sanitary literature published by the Provincial Board of Health. For the latter no remedy exists save the vigilance and vigour of your Board.

D. R. FARQUHARSON,
Secretary.

ESSEX.

Tilbury West Township.

SECRETARY'S REPORT.

The local Board of this township has not had the necessity of exercising many of the powers conferred upon it by the Public Health Act, as the sanitary condition of it is good, and the general health of the people also.

J. B. CHAUVIN,
Secretary.

PEEL.

Toronto Township.

SECRETARY'S REPORT.

Herewith I have the honour to present the first report of the Local Board of Health of the Township of Toronto.

We have a Board of Health, but not actively engaged. The Board has a Health Officer appointed by the Council. The Health Officer is a medical man. He is not a salaried officer. We would beg leave to further state that from the sanitary condition of the township, the Board has had no cause to take any active measure in reference to *The Board of Health Act.*

J. EAKINS,
Secretary.

HURON.

Tuckersmith Township.

CHAIRMAN AND SECRETARY'S REPORT.

We have the honour to submit the first annual report of the Local Board of Health of this township. A general supervision by members of Board has been adopted. It is hardly necessary to say that we have had a year exceptionally healthy. Our schools, ten in number, have been in operation during the whole year; and in only one, where three or four children were affected with Scabies, which was promptly treated by Dr. Campbell, has there been any sickness beyond the ordinary ailments of children; a slight cold, or an immoderate use of fruit, being a probable cause, but not preventing attendance at school more than a day or two.

JACOB McGEE, Chairman.
WM. McCONNELL, Secretary.

HURON.

Township of Turnbury.

CHAIRMAN'S REPORT.

The Board has much pleasure in reporting as follows: That after being duly organized in accordance with the Act, the members of the Board agreed to take the respective districts in which they reside to enforce the by-law as far as possible. That with the exception of the removal of one or two nuisances, the duties of the Board have been very light. That no cases of Diphtheria or fevers of any kind were reported to the Board as being in the schools, nor in the villages in the township, nor have any deaths from any of the above named diseases been reported to the Board. That so far as known to the Board no Diphtheria nor any malignant disease is in the township. That in the present state of good health in general the Board did not advise the appointment either of a Sanitary Inspector or Medical Health Officer.

JAMES ELLIOT, Chairman.
THOS. FORTUNE, Secretary.

HURON.

Usborne Township.

SECRETARY'S REPORT.

A Local Board of Health has been duly organized, but beyond that and the appointing of a Medical Health Officer (Dr. Irving) nothing has been done. Wells may be affected by excreta when too closely situated to privies or with surface water. Have not noticed any disease having its origin in the drinking of well-water. Very little disease other than a few cases of Whooping-Cough has occurred since formation of the Board. There are no slaughter-houses in the township.

N. J. CLARK,
Secretary.

SIMCOE.

Township of Vespra.

SECRETARY'S REPORT.

I beg to report as follows: That in accordance with *The Public Health Act* of Ontario a Local Board of Health for the Township of Vespra was organized in May last. That the Board has exercised its powers in removing all nuisances where found or reported. That there have been no cases of contagious diseases in the Township, and that the sanitary condition and public health of the township are satisfactory.

GEO. SNEATH,
Secretary.

WELLAND.

Wainfleet Township.

The Local Board of Health of the Township of Wainfleet beg to report as follows: There being no resident doctor in the township, the Board appointed no Medical Health Officer. The sanitary condition of the municipality has been good so far the present year.

is concerned. There have been no epidemic or contagious diseases except Whooping-Cough. This Board recognize the importance of local organization, believing that much may be done that would tend to prevent the spread of infectious diseases.

JOHN HENDERSON,
Secretary.

PERTH.

Wallace Township.

CHAIRMAN AND SECRETARY'S REPORT.

The Local Board of Health of the Township of Wallace met on the 29th November, 1884, and beg to report that the sanitary condition of the township is in a fairly good condition; that there has been no epidemic, endemic, or contagious disease prevailing in the township during the current year

GEO. FOLLIS, Chairman.
R. G. ROBERTS, Secretary.

NORFOLK.

Walsingham Centre Township.

SECRETARY'S REPORT.

In yours of the 3rd November you say that the fact of the appointment of a Sanitary Inspector by the Board implies that it was considered necessary to do public health work. In this you are in error. First, the Municipal Council and not the Local Board appoints the Inspector. Second, the appointment does not imply that any health work was necessary, but simply that in case the services of that officer at any time became necessary it might be available without waiting for a regular or calling a special meeting of the Council to appoint him.

Fortunately his services have not been required, and the President of the Board declines to call a meeting merely to send a report of *nothing* done.

However, if a report is absolutely necessary, if you will kindly send the necessary blank form I will fill it up and return it to you, or have it filled and returned.

JOHN PHELAN,
Secretary.

WATERLOO.

Township of Waterloo.

CHAIRMAN AND SECRETARY'S REPORT.

The members of the Local Board of Health for this municipality were appointed by the Council on the 31st of May last, in accordance with *The Public Health Act, 1884*, and held their first meeting on June 9th, for organization. Messrs. Blaschke & Son, butchers, of the Village of Blair, were notified to remove their slaughter-house to such place as would not endanger public health, and in accordance with such notice they erected a new slaughter-house, which is beyond the limits prescribed by the Act.

The Secretary was instructed to prepare a compilation of the *Health Act*, embodying such sections as are particularly applicable to rural municipalities, and to have 1,200 copies of the same printed in English and 800 in German. This was done, and the same forwarded to the teachers in the several school sections for distribution among the residents in each

section; and other means adopted by which it is believed that a copy has been introduced into nearly every household in the municipality, thus insuring that the people will become acquainted with the provisions of the Act.

The Secretary also procured 250 copies of the blank forms for physicians to report on outbreaks of infectious diseases, death forms, etc., which were distributed among the physicians practising in the municipality.

Complaints were made to this Board that the creek running from the Town of Waterloo through Bridgeport to the Grand River, was seriously polluted by the waste and offal from the distillery and woollen factory in the Town of Waterloo. The owners of these establishments were notified by the Secretary of the Board to remove, or abate the nuisance; and, as they paid no attention to such notice, and in accordance with the provisions of *The Public Health Act, 1884*, the Secretary of the Provincial Board was appealed to. Dr. Bryce thereupon came and inspected the creek, and at once acknowledged its offensiveness, and the danger to which the public health was exposed thereby; and ordered the persons interested to at once abate the nuisance. In accordance with the advise of the Secretary of the Provincial Board, the proprietors of the woollen factory are having two filtering tanks erected, one of a capacity of 150 barrels and the other about half that size, which it is believed will in a great measure abate the nuisance.

The Secretary of the Board, in accordance with instructions, also notified the Secretary of the Waterloo Town Board to at once put a stop to the depositing of filth and offal of any description into the creek within the corporation.

There have been a few cases of Whooping-Cough during the year, but apparently of rather a mild type. There were also a couple of cases of Cholera Morbus of a very virulent type, which proved fatal in from two to four days. There were five cases of Typhoid Fever reported, one of which proved fatal, a female aged twenty-one years; but by the adoption of strict measures of disinfection and proper caution in regard to isolation, the disease in each case has been confined to the scene of outbreak. The general health during the past year has been about as good as the average of former years, although there has been a marked increase in the death rate, which, however, has been among persons well advanced in years and children of tender age.

T. B. SNIDER, Chairman.
GEO. A. TILT, Secretary.

Muskoka and Parry Sound.

Watt Township.

CHAIRMAN AND SECRETARY'S REPORT.

The Local Board of Health have much pleasure in stating that the sanitary condition of this township is in a very satisfactory state. The Board have also much pleasure in stating that no outbreaks of disease of any kind have occurred during the year; three deaths only have taken place in the municipality during the year, two of the above deaths being from old age and the other being an infant; this out of a population of 800 is most satisfactory.

A. SUFFERN, Chairman.
FRED. RICHARDSON, Secretary.

Huron.

Township of Wawanosh East.

CHAIRMAN'S REPORT.

The Board beg to report that the sanitary condition of the Township of East Wawanosh, so far as each member of the Board is aware of, is at present good; that no

contagious disease of any kind, so far as they are aware, is to be found within the limits of the said township; and that we have no village within the precincts of the Township of East Wawanosh.

At present they have no Medical Officer or Sanitary Inspector.

The above is all the report of the said Local Board of Health for the Township of East Wawanosh for the year 1884.

JAMES McCALLUM,
Chairman.

WENTWORTH.

Township of West Flamboro'.

MEDICAL HEALTH OFFICER'S REPORT.

I beg leave to submit the following as regards the health of the township: It has been remarkably good, the only epidemic which prevailed in this district was Scarlet Fever of a very mild type, of which there were nineteen cases, the ages ranging from 1½ to 13 years, and no deaths. I have been at a very late period informed that there were some cases of Scarlet Fever and Whooping-Cough, which have not been reported by the medical practitioner in attendance on such cases.

A. W. SHAVER, M.D.,
Medical Health Officer.

Township of West Flamboro'

SANITARY INSPECTOR'S REPORT.

I beg leave to submit to you a summary of the sanitary condition of the Township of West Flamboro', of which I have been appointed Inspector, for the year 1884.

The slaughter-houses situated in the township, although not altogether under the requirements of the Act, are kept in such a condition that they fail to become a nuisance or any way a detriment to the public health.

The villages of Freelton, Strabane, West Flamboro', Milgrove, Greensville and Bullock's Corner, I also visited, and found them all in a good sanitary condition, and found nothing that would cause a nuisance or would be prejudicial to the public health.

And in conclusion I beg leave to state that in taking a summary review of my visitations throughout the township, I find that it is in a very satisfactory state, all of which I humbly submit.

CHAS. FOSTER,
Sanitary Inspector.

WELLINGTON.

Township of West Luther.

CHAIRMAN'S REPORT.

Your Board of Health beg leave to report that they met pursuant to statute, on the 9th day of June, 1884, and organized at the house of Mr. Huball Damascus.

Sanitary Inspector Brisnahan called the attention of the Board to the stagnant water in the Jordan Creek.

After examining the same we instructed the Sanitary Inspector to notify the owners of the land where there was stagnant water to have all obstruction removed from the bed of the Creek, so as to give the water a free course, and to have it straightened from the bridge on the side line between lots 9 and 10, con. 6, to the bridge on the 6th and 7th concession lines on lot 9.

On the 19th day of July your Board met for the purpose of reconsidering a change in the bed of the Creek. Thomas Graham, on whose property the stream runs, objected to the straightening of the same from the bridge on the side line on account of its coming so close to his saw mill, but agreed to a straight line from the bridge in his mill yard to the 6th concession line, which was agreed to by your Board, all of which has been completed.

As no cases of sickness in the municipality have been reported to us, your Medical Health Officer has never been called on by us.

JAMES ISLES,
Chairman.

SECRETARY'S REPORT.

To the several questions of your circular I beg to reply as follows:—(*a*) The digging of a watercourse to purify a stream in the vicinity of a steam saw mill has been done. (8) In too many cases, I fear, thrown from the door-step. (9) Mostly goes to swill barrel for the pigs. (10) Not that I am aware of. (11) From wells. (12) Some of the wells must be sadly contaminated by refuse and filth, especially urine. I would strongly recommend the Provincial Board to have the clause respecting the cleaning of wells made compulsory, and once *every* year at that. (18) Measles being the only contagious disease prevalent this year, no precautions were taken to guard against it, as it is a disease not much feared by country people. (20) There is a lake on the borders of this municipality of stagnant water of small extent, less, I think, than 20 acres; again, there is stagnant water at a saw mill in the very centre of the township, which I believe to have been the breeding ground of the diphtheria cases in the township those past years.

JAMES McLUHAN,
Tp. Clerk.

MIDDLESEX.

Township of Westminster.

CHAIRMAN'S REPORT.

Our Local Board was organized by a by-law of the Municipal Council passed June 4th, '84. H. Anderson was appointed Inspector and instructed to inspect all the cheese factories and slaughter-houses in the township, and give those in good order written permission to continue their business, and to insist that those not in good order should be put in proper shape to be entitled to a permit; we have six cheese factories and six slaughter-houses in the township. Most of them were all right, but several were found in a miserable, filthy state, certainly dangerous to the health of the people in the vicinity. I am happy to say that there was no disposition on the part of the owners to dispute our authority or resist the law, so that with little difficulty we have got them all in good shape, although it cost the owners considerable in some cases for drainage and other work.

The establishment of the Board is very popular in this township, nearly all acknowledging that it was a necessity.

Our Council got 200 copies of the Health By-Law printed for distribution, striking out some parts that we considered unnecessary in a township. I send you a copy. We have also got the other forms required by law printed.

Our township has been very healthy this year. We have had no epidemic or infectious diseases except a few isolated cases of Typhoid Fever. We have held four regular meetings of the Board this year to receive the reports of the Inspector and to investigate complaints about bad wells, privies, etc, all of which we got satisfactorily settled.

The expenses of the Board for this year have been about $60, which has been willingly paid by the Council.

J. T. COUGHLIN,
Chairman.

OXFORD.

Township of West Zorra.

CHAIRMAN'S REPORT.

The Board of Health for the Township of West Zorra beg to report :—

1st. That the Board was formed in accordance with the Act, being composed of the Reeve, Clerk, John A. McKay and John Blair, members of the Council, and James McKay.

2nd. That the by-law, with some slight amendments to adapt it to a rural municipality, was adopted by the Council.

3rd. That the sanitary condition of the township is good, and that there has been no epidemic during the year.

JAMES MUNRO,
Chairman.

ONTARIO.

Whitby East Township.

SECRETARY'S REPORT.

As no complaints were lodged, the Board did very little sanitary work during the early part of the season, but later on in the year a petition was presented to the Board, requesting them to attend to some stagnant water in the neighbourhood of Cedar-Dale.

The Board, as a Committee of the Whole, met in Cedar-Dale, and examined the cause of complaint. They found that although no water was then standing on the premises complained of, and that no disagreeable smell emanated therefrom, yet evidently a nuisance had existed there a short time previously. The Secretary was directed to correspond with the owner of the grounds and request him to drain and level them. I understand the request of the Board has been complied with.

The Board also examined the condition of the Grand Trunk Railway Company's Freight Sheds, in Cedar-Dale, (Oshawa Station), and found them in a state disgraceful to the company that controls them.

The Secretary was instructed to notify Mr. Bell, solicitor of the company, of the true state of affairs. No reply was received to the communication.

East Whitby being a rural municipality, and there being no Sanitary Inspector it is difficult to state the exact sanitary condition of the Township, but I believe it compares favourably with the majority of municipalities in the Province.

I do not know of a single case of Typhoid Fever, Diphtheria, or other contagious disease in the Township.

WILLIAM PURVES,
Secretary.

Whitby West Township.

SECRETARY'S REPORT.

A Board of Health for the aforesaid municipality was appointed by the Township Council on the second day of June, 1884.

No Medical Health Officer or Sanitary Inspector has been appointed for the municipality.

At a meeting of the Board held June 16th, there was a Committee appointed to make selections from the Act in reference to sanitary measures and public health, and have the same printed for distribution in the municipality.

Said Committee have performed their duty, and have caused notices to be printed, calling upon the inhabitants of the Township to endeavour by cleanliness in their premises, water courses, wells, etc., to aid in the prevention of disease, and to report to Board of Health any nuisance or filthiness coming under their observation, which they deemed detrimental to the good of individuals or the community.

Only one complaint has been received by the Secretary, that of the 7th instant, which has not as yet been acted upon by the Board.

The municipality has not been visited to any great extent by any contagious, or infectious, or other disease during the year.

D. HOLLIDAY,
Secretary.

YORK.

Whitchurch Township.

SECRETARY'S REPORT.

I am instructed by the Local Board of Health of the Township of Whitchurch to acknowledge the receipt of note book and memorandum for the use of Inspector, and to say, by way of our report, that beyond organizing we have not been called upon to do anything.

There has been no case of malignant or infectious disease reported in the township and the Inspector has not been required to make any inspection. Hope this state of things may continue.

J. W. COLLINS,
Secretary.

WATERLOO.

Wilmot Township.

SECRETARY'S REPORT.

It gives me much pleasure to state that the sanitary status of our township has been during this year in a most excellent and healthy condition, to which effect also all members of our Local Board have expressed themselves at our last meeting, held November 24th, 1884. During the year, up to date, only two cases of death have been sent in for registration of a zymotic disease, namely, Whooping-Cough, which resulted in the death of two small infants.

Much improvement has been going on in late years by draining waste and swamp lands. I also may state that no complaints of the existence of any stagnant water came to my knowledge.

According to a resolution passed by our Local Board of Health, all dead animals, also refuse from slaughtering-houses and tanneries must in future be buried or disinfected.

You will please find enclosed the report of A. H. Miller, M.D., Medical Health Officer for the Township of Wilmot, with the Secretary's report to Provincial Board of Health, which were adopted at the last meeting, November 24th, by the Local Board of Health.

HENRY LIERSCH,
Secretary.

MEDICAL HEALTH OFFICER'S REPORT.

It is a matter of congratulation that the Municipality of the Township of Wilmot, acting upon the recommendation of the Provincial Board of Health, has established a Local Board to look after the sanitary interests of the township.

I may also congratulate the Board of Health of the Township of Wilmot upon the freedom of the municipality from any of the zymotic diseases, none of them being prevalent during the year.

A. H. MILLER, M.D.,
Medical Health Officer.

MIDDLESEX.

Williams East Township.

SECRETARY'S REPORT.

In compliance with the requirements of the statute, I now beg to lay before you the annual report of the sanitary work done during the year, and of the sanitary condition of the municipality, for your consideration.

Respecting the first, with the exception of the burial of a dead horse, no sanitary work has been required, and in regard to the sanitary condition of the municipality it affords me heartfelt pleasure to be able to report that it never was better. There has not been a single case of contagious disease in the municipality during the entire season of 1884.

D. WYLLIE,
Secretary.

WATERLOO.

Township of Woolwich.

CHAIRMAN'S REPORT.

In accordance with the provisions of *The Public Health Act of Ontario*, 1884, the members of your Board met at St. Jacobs on Monday, the 19th day of May, 1884, and organized as follows:

Mr. J. P. Snyder was appointed Chairman, and Mr. John L. Wideman, Secretary of the Board.

A committee was appointed with instructions to select certain sections and clauses of *The Public Health Act of 1884*, and to get the same printed in circular form and sent to the ratepayers and householders of the municipality, which instructions were subsequently carried out as follows: The selections were made by the committee and submitted to the Board for approval at a subsequent meeting and adopted, and instructions given to the Secretary to get six hundred copies in English and four hundred copies in German printed and distributed as above directed. The circulars were sent out in the name of Dr. Pasmore, as Medical Health Officer and Sanitary Inspector. Applications were made during the year for permits for keeping slaughter-houses. After due inspection by the Sanitary Inspector and favourably reported on, permits were granted.

Various other applications and complaints were heard, and after due inspection by the proper officer, were arranged and settled.

J. P. SNYDER,
Chairman.

SANITARY INSPECTOR'S REPORT.

I have the honour to report to you that the state of health of this township is and has been during the year 1884, on the whole very good. There have been a few cases here and there of Scarlet Fever, Diphtheria and Typhoid Fever, and Dysentery was slightly epidemic for a few weeks in the fall.

No reports were made to me.

The Act has, I think, done great good, especially in the villages, where some privies and slaughter-houses were getting to be offensive. I did not make a house to house inspection, as the Board directed me to attend to cases only that were in some way brought to my notice. A circular containing the most important parts of the Act was issued, and a copy sent by mail to every ratepayer. It was productive of good, as a number of farmers told me that they would build new pig-styes at the required distance.

H. J. PASMORE,
Sanitary Inspector.

ELGIN.

Yarmouth Township.

SECRETARY'S REPORT.

The Board met once, and inspected slaughter-houses. Improvements were ordered and attended to. Other meetings were called, but could do nothing for want of a quorum.

K. W. McKAY,
Secretary.

LEEDS AND GRENVILLE.

Yonge, Front of, Township.

CLERK'S REPORT.

In reply to your letter of October 21st, I can only say the Council of the Township of Front of Yonge declined to organize a Local Board, consequently I am sorry to have no report to make. I readily understand the importance and the good that might be derived from such a Board. I have no authority from the Council to state their reasons for not moving in the matter; in fact I do not know them.

M. J. CONNOLLY,
Clerk.

KENT.

Township of Zone.

MEDICAL HEALTH OFFICER'S REPORT.

Having only recently been appointed Medical Health Officer for the Township of Zone, I cannot make as lengthy a report as I would otherwise do. I might say, however, that there has been very little sickness in the southern portion of the township. There has been no contagious or infectious disease, with the exception of one isolated case of Typhoid Fever.

Should I be honoured with the appointment for another year, I will endeavour to make myself better acquainted with the sanitary condition of the whole township.

R. D. SWISHER, M.D.,
Medical Health Officer.

* Victoria.

Township of Mariposa.

SECRETARY'S REPORT.

The Council appointed members and officers to the Local Board of Health in May, 1884. Since the Board was organized several meetings have been held, in order to carry out the requirements of the Statute respecting Public Health. The Sanitary Inspector made a thorough inspection of each Village in the Municipality, and his report to the Board shewed the following results :—He ordered five cellars to be cleaned out; twenty privies to be cleaned out, and some of them to be removed; eleven notices were given to parties to remove manure heaps; twenty-one pig-pens were ordered to be cleaned, and some of them to be removed altogether; eight wells and eight cisterns were ordered to be cleaned out. We have the pleasure to report that in each of the above named cases, the inhabitants readily carried out the instructions of our Sanitary Inspector.

Annexed you will please find the Report from our Medical Health Officer. The Council have ordered a number of copies to be printed of said Report, for distribution among the ratepayers of the municipality.

JOHN F. CUMMINGS,
Secretary.

MEDICAL HEALTH OFFICER'S REPORT.

Since my appointment in May last as your Medical Health Officer, I have given some special attention to the sanitary condition of the municipality, and I congratulate you upon the fact that, speaking in a general way, the sanitary condition of the Township may be called good. We have in this Township no large lumbering operations, sawmills, or factories, around which constantly accumulate large quantities of decaying organic and vegetable matter, producing miasms and noxious gases, rendering the air impure and thus engendering disease.

Swamp lands which hold more or less stagnant water, exist to a considerable degree in the township, but these are being gradually cleared up and drained, which will, in time, enhance the sanitary condition of the municipality considerably. Our township being almost purely agricultural in its pursuits, and the farmers generally in easy circumstances, their dwellings and outhouses are, as a rule, large and commodiously built; yet, in one important particular, we frequently find the dwellings deficient. When erecting those fine, large, brick houses, special attention seems to be given to the conservation of heat, and the very important matter of ventilation entirely overlooked. In days gone by, when more moderate circumstances prevailed, and the old log house was the place of abode, our families grew up robust and healthy, and a large factor in this result was due to the free and natural ventilation of those homes. In building, now-a-days, every precaution is taken to exclude the fresh air and keep the heated air within. The science of ventilation is one well worthy the investigation of our people at the present day, as living in close rooms and breathing the same air over and over again, is a prolific source of many serious diseases.

Your very efficient Sanitary Inspector has made thorough inspection of our little villages, and the result is a pretty general reform in the sanitary condition of many houses, yards and streets. Under his directions, wells, cisterns and cellars have been cleaned and disinfected; sink-holes filled up, and manure and other decaying matters removed, which had previously been considered a nuisance. As a whole the people have, much to their credit, responded to those calls with alacrity.

The Board of Health and the township are to be congratulated on the fact that we

* Note.—These reports are inserted here, they having been omitted from their proper alphabetical position.

have not been visited by any serious epidemic of contagious or infectious disease during the past season. There have been reported of typhoid fever only three cases, two of which occurred in the Village of Oakwood, and one in the Village of Little Britain, all of whom recovered; one case of Diphtheria in the Village of Oakwood recovered; one case of Whooping-Cough in the Village of Manilla, which case, being complicated with Bronchitis, died; two cases of Mumps are reported from the Village of Oakwood. The above is a complete list of all cases reported and is, we think, a very favourable showing as to the sanitary condition of the municipality. Had the sanitary condition of the neighbourhoods in which those cases of Typhoid Fever occurred, been poor, the probabilities are that more cases would have been reported, and that of a more malignant type, and of more fatal results.

We think it well to remind the Board of the fact that only a small proportion of the children, and we believe of the adults, possess the security that vaccination brings. We think the subject of great importance and it should not be neglected. Other Boards of Health are looking into the matter, and some means should be taken in this municipality to remind parents that it should be attended to; the truth of the importance of this hint would be fully proven were we to have even one case of Small-pox develop in our midst. It would be well for people to understand that having been once vaccinated at s me time in the past does not necessarily give them that security desired; and seven or eight years, in the majority of cases, is as long as protection remains.

Hoping the few hints in the above may be useful, and the report, as a whole, may find your approval,

A. E. VROOMAN,
Medical Health Officer.

(No. 71.)

Return of copies of all regulations directed and appointed by the Lieutenant-Governor in Council, under authority of the Act respecting the expenses of the Administration of Justice in Criminal Matters, Revised Statutes, chapter 86, for the examination, auditing, vouching and approving of such expenses as are paid out of the Consolidated Fund in accordance with said Act. (*Not printed.*)

(No. 72.)

Return shewing the lots in the Township of Harvey, in the County of Peterborough, which, while under license for the cutting of timber, have been sold since the first day of January, 1880, with a statement of the date when the right to cut timber under such license would cease in consequence of such sale. Also, the name or names of the license holders whose license covered such lands. (*Not printed.*)

PROCEEDINGS

OF THE

ANNUAL CONVENTIONS

OF THE

DAIRYMEN'S ASSOCIATIONS

OF

WESTERN AND EASTERN ONTARIO,

1885.

Toronto:
PRINTED BY GRIP PRINTING AND PUBLISHING CO., FRONT STREET.
1885.

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PREFACE.

The eighth Annual Meeting of the Dairymen's Association of Western Ontario for 1885, was held in the Town Hall at Stratford, on Wednesday, Thursday and Friday, the 14th, 15th, and 16th of January, rather earlier in the year than these meetings have heretofore been holden. The attendance on this occasion was not as large as the Directors had reason to expect, as special pains had been taken to have a good staff of those learned in the dairy business to combine scientific with practical knowledge in the investigation of dairy improvements. The Directors, we think, fulfilled their part of the programme, and though it may not have been responded to on the part of factory men, yet we think those that did attend must feel that their time was not spent in vain, as the many and interesting papers that were submitted, as well as the intelligent practical discussion of their contents from the floor of the Hall, was a strong proof of the interest taken in their merits by the dairymen. We could not but think as these spirited discussions were going on, that if the same interest was manifested by the agriculturist in the other branches of farming as has been developed by these conventions, great advances would be made in general agriculture, as intelligence and skill combined with chemical knowledge has now become so necessary in its application to successful husbandry, that he who neglects to cultivate his mind as well as his fields, will be soon left behind in this progressive age when steam and electricity have become such a motive power, and form so important a factor in pushing on the human family to higher and still higher progression. We were pleased to hear the dairymen speak so satisfactorily of the past and so hopefully of the future of this branch of agricultural industry ; it is but a confirmation of the ideas of the writer, expressed years ago, when the industry was expanding at a very rapid pace : fears were expressed that the business would be overdone, the writer's opinion was, and was often so expressed, that it would prove the most profitable and enduring branch of farm industry, and capable of almost illimitable expansion. This idea, we are glad to find, is now very generally accepted and the dairyman is happy. The excellence of Canadian cheese is largely due to the advanced ideas demonstrated through these conventions, and no enterprising dairyman can afford to ignore this influence. The money value of cheese is now a very important item among the commercial exports of our country, and when we add to this the very large increased value in the farm producing it, this Association may well take great credit to the organization that has contributed so much to this great success, and though farmers as a body are rather slow to avail themselves of benefits derived from such a source, it need be no discouragement to the Directors if their labours are not always appreciated at their full value, nor should it be any reason that they should abate their efforts in aiding and assisting the continued development of this great industry, on the principle that he is the true patriot who strives to make two blades of better grass grow where but one grew before.

C. E. CHADWICK,
Secretary.

Secretary's Office, Ingersoll, January 23, 1885.

REPORT

OF THE

DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO

FOR THE YEAR 1884.

To the Honourable the Commissioner of Agriculture :

Sir,—I have the honour to present the Report of the Dairymen's Association of Western Ontario for the year 1884, in accordance with the provisions of sub-section 10 of section 102, chap. 17, of 40 Vic., Ontario Statutes. The proceedings have been carefully reported by an expert shorthand reporter ; it also contains a detailed statement of receipts and expenditures, together with a large amount of useful matter connected with the industry represented by the Association, tending to increase its usefulness.

I have the honour to be your obedient servant,

C. E. CHADWICK,

Secretary.

Secretary's Office, Ingersoll, February 27th, 1885.

DIRECTORS FOR 1885.

PRESIDENT:

THOMAS BALLANTYNE, Esq., M.P.P., Stratford.

1st VICE-PRESIDENT:

H. S. LOSSEE, Esq., Norwich.

2nd VICE-PRESIDENT:

HENRY PARKER, Esq., Woodstock.

SECRETARY:

C. E. CHADWICK, Ingersoll.

TREASURER:

J. C. HEGLER, Ingersoll.

DIRECTORS:

Division No. 7.—R. HAY, Wyandotte.
" 8.—A. SPIERS, Caistorville.
" 9.—E. CASWELL, Ingersoll.
" 10.—W. MESSER, Blueville.
" 11.—JOHN WHEATON, London.
" 12.—L. CLEVERDON, Strathroy.
" 13.—J. H. MASTERS, Cookstown.

AUDITORS:

J. CRAIG, Woodstock. J. S. PEARCE, London.

LIST OF MEMBERS

OF THE

DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO

FOR THE YEAR 1885.

Name.	Post Office.	Name.	Post Office.
Alderson, James	Kintore.	Bray, Jacob	Listowell.
Allison, William S	Rothsay.	Bell, George	Bryanston.
Alderson, Thomas	Kintore.	Blake, Hiram	Lyons.
Angus, William	Newry.	Brodie, John	Gladstone.
Armerod, William	Stratford.	Baker, Thomas	Eastwood.
Agur, William	Pond Mills.	Baine, John	Jarvis.
Adams, John	Cainsville.	Beeton, James	Kerwood.
Agur, John W.	Whitedale.	Bell, Adam	Sebringville.
		Boyd, J. W.	Atwood.
Bradley, Frank	Orwell.	Bradley, F.	Mapleton.
Ballantyne, S. J	Listowell.		
Ballantyne, Thomas, M.P.P.	Stratford.	Cranston, R. R.	Stratford.
Bollert, Harmon	Cassel.	Coleman, F. J.	Fullarton.
Burtch, William	Lambeth.	Copeland, J. W.	Eastwood.
Ballantyne, Robert	Sebringville.	Cousens, George	St. Marys.
Bayard, Charles	Motherwell.	Curtis, D. W.	Listowell.
Bothwell, William	Woodstock.	Casswell, E.	Ingersoll.
Brown, M. R.	Brownsville.	Chartes, Robert	Egmondville.
Bennett, James	Cathcart.	Clark, James	Gorrie.
Bartlett, Wm. John	Fullerton.	Cleland, Robert	Listowell.
Ballantyne, Robert	Stratford.	Corliss, John	Avon.
Brentnell, A. H	Belleville.	Campbell, W. J	St. Marys.
Browning, George	Lonsboro'.	Caddie, Thomas	Ingersoll.
Barthel, George	Stratford.	Chalmers, G. W	Poole.
Bean, William	Walkerton.	Charlton, W. J.	Napier.

List of Members—*Continued.*

Name.	Post Office.	Name.	Post Office.
Cleverdon, L.	Strathroy.	Grey, J. A.	Newry.
Casswell, Walter	Tilsonburg.	Grey, James	Forest.
Coleman, Dr.	Seaforth.	Gourlay, B.	Thorndale.
Cline, F. E.	Attercliffe Station	Gray, William W.	Newry.
Caddie, Robert	Verschoyle.	Griffith, A.	Thorndale.
Chown, W.	Elmville.	Hunter, A.	Ingersoll.
Dunlop, William	Fordwich.	Hopkins, E.	Evelyn.
Deo, Charles	Gladstone.	Hannah, John	Egmondville.
Disher, E. O.	Ridgeway.	Hunter, E.	Woodstock.
Drummond, Robert	Ingersoll.	Hainer, John H.	Harley.
Downham, Peter	Bryanston.	Harkison, L. M.	Corinth.
Dickenson, James	Elma.	Howard, Samuel	Gorrie.
Dillon, S. J.	Kenilworth.	Hunter, Samuel	Rockton.
Davidson, John	Cargill.	Haines, Frank	Fullarton.
Down, A. T.	Flesherton.	Harris, Wallace	Attwood.
Dunn, Thomas	Muirkirk.	Hopkins, J. E.	Innirkip.
Delbridge, George	Eastwood.	Harris, William	Atwood.
Dunn, Peter	Hickson.	Hyde, Mathew	Stratford.
Evans, G.	London.	Hutchinson, E.	Avonbank.
Elgige, James	Delaware.	Hoyt, Henry	Exeter.
Elliott, James	Tilsonburg.	Iddington, Peter	Stratford.
Eagle, Harold	Bismarck.	Isaac, John	308 Dundas Street, London East.
Farrington, J. L.	Norwich.	Johnson, Hamilton	Wellandport.
Farrington, George	Norwich.	Johnson, H. M.	Stratford.
Ford, E.	Lynn Valley.	Johnson, Charles	Whiting.
Ferguson, J. A.	Harriston.	Johnson, William	Woodham.
Fulton, John	Brownsville.	Jenkins, Charles	Corinth.
Facy, Robert	Harrietsville.	Joeller, Daniel	New Hamburg.
French, Alex. M.	Courlice.	Kline, Jacob	Bismarck.
Gillard, William	Tavistock.	Kidd, Joseph	Dublin.
Grieve, Thomas	Moorfield.	King, John	Stratford.
Grant, W. W.	Jerseyville.	Lamont, John G.	Eastwood.

List of Members—*Continued.*

Name.	Post Office.
Lossee, H. S.	Norwich.
Lawrason, Miller	Cathcart.
Leach, A. R.	Milton.
Lee, Samuel R.	Bookton.
Lockhead, William	Listowel.
Lobbal, Alexander	Atlas, Gennesee Co., Michigan.
Laird, S. W.	Brussels.
Lynch, W. H.	Danville, Que.
Loney, William	Tarbart.
Little, John	Henfrym.
May, J. B.	Drayton.
Montgomery, William	Goldstone.
Mabee, R. Y.	Vittoria.
Montgomery, William	Goldstone.
Merril, William	Norwich.
Morrison, Miss Agnes	Newry.
Morrison, Miss Mary	Newry.
Mills, James H.	Thamesford.
Mundy, George	Mapleton.
Morris, John C.	Winthrop.
Malcom, David	Innerkip.
Moyer, M.	Walkerton.
Mayhew, Robert	Renfrew.
Manning, Nicholas	Uttoxeter.
Morton, Robert	Cassel.
Mathews, James	Acton.
Morris, Ferris	Tilsonburg.
McDougall, W. A.	Wendigo.
McLeod, George B.	Thamesford.
McCrady, N. S.	Lakelet.
McLaren, James	Dublin.
McKay, James	Harrington.
McLean, W. H.	Crinan.
McEwan, George	Hampton.
McIlwraith, James	Bookton.
McKenzie, A.	Shakespeare.
McCartney, Thomas	Brucefield.
McEwan, James	Sebringville.
McAlpine, J. C.	Beaver.
Noxel, Armenus J.	Cathcart.
Newcome, N.	Ostrander.
Ontario Mills Bucket Co.	Toronto.
Ovens, Charles	Bluevale.
Ostrander, John M.	Guysboro'.
Peebles, John	Donegal.
Pierce, J. S.	London.
Parker, A.	Canboro'.
Pelton, Alfred	Innerkip.
Parrott, William	Borneholm.
Pomeroy, William	Fullarton.
Parker, Henry	Woodstock.
Patterson, James	New Durham.
Patterson, Joseph	West Flamboro'.
Phillips, W. R.	Napier.
Pickard, Arna	St. Marys.
Patterson, George	West Flamboro'.
Podmore, John	Ingersoll.
Rice, A. C.	Sarnia.
Richards, D. W.	Flint, Mich.
Ragen, Edward	Harley.
Richardson, L. R.	Strathroy.
Rundle, P. F.	Napier.
Ruckle, A.	Lyons.
Ruddick, J.	Huntingdon.
Riley, Charles	Ingersoll.

List of Members—*Continued.*

Name.	Post Office.	Name.	Post Office.
Robertson, John	Cotswold.	Shearer, John	Listowel.
Root, Richard	Strathroy.	Stacey, Thomas	Stratford.
Sanderson, James	Listowell.	Shearer, W. R.	Villa Nova.
Stevenson, William	Britton.	Thompson, William	Arkona.
Symington, William	Camlachie.	Thompson, George	Bright.
Schragg, C.	New Hamburg.	Todd, John	Cairngorm.
Stark, Robert A.	Goderich.	Toole, J. S.	Aurora.
Smith, S. A.	Lambeth.	Townsend, John	Avonbank.
Shonk, D.	Ingersoll.	Turner, C. E.	Tilsonburg.
Shearer, William	Listowel.		
Southwick, H. A.	Hawtrey.	Wing, P.	Drayton.
Schragg, Daniel	New Hamburg.	Woods, William	Molesworth.
Sanborn, J. E.	Granton.	Waddel, William	Ingersoll.
Stevely, William	London.	Wettlaufer, George	Amnbree.
Steiner, John	New Hamburg.	Walters, James	Gorrie.
Scott, J. W.	Sparta.	Ward, R. J	Alviston.
Steinhoff, J. W.	Brownsville.	Wheaton, John	The Grove.
Spiers, Adam	Caistorville.	Wheaton, John W.	Palmerston.
Slawson, C. H.	Ingersoll.	Waldie, Alexander	Acton.

EIGHTH ANNUAL CONVENTION

OF THE

DAIRYMEN'S ASSOCIATION OF WESTERN ONTARIO.

The Convention assembled in the Town Hall, Stratford, on Wednesday, January 14th, at 1.45 p.m., the President, Mr. L. R. Richardson, of Strathroy, in the chair.

The President said that this was the 18th Convention held by this Association, and he remembered well the first Convention that was held in Ingersoll years ago, when the Association was in its infancy. The gatherings had increased since then, both in quality and in quantity. He referred to the low price grain had brought the last season, but said they should congratulate themselves on the price they had realized for cheese, which was sold for a better price than that made in the United States. In the past some of their experts had been hired to come over here to instruct our cheese makers in the art of making good cheese, but he thought some of us should now go over to give the Americans instruction in making cheese.

He then appointed Messrs. Parker, Lossee, Spears, Hunter, and Cook, a Committee on "Order of Business."

The Committee furnished the following programme:

1st. Mr. H. WADE, Sect. of the Agriculture and Arts Association of Ontario, "Cows for the Dairy."

2nd. Mr. Thos. Shawe, editor of *The Live Stock Journal*, Hamilton, "Possibilities of the Dairy Cow."

3rd. Discussion on both the above papers.

The President then called on Mr. Wade, who came forward and read his address on "Cows for the Dairy."

COWS FOR THE DAIRY.

Having been requested to read a paper to this Convention the question at once arose to my mind, what do I know that is of interest to dairymen, as it is five years since I gave up the honourable calling of a farmer, and fully ten since I gave up cheese making. Since then, it is true, I have been working all the time amongst the cattle interests, but not in such a practical way; the recording of pedigrees does not tell the story of how much butter or cheese the animal would give, nor the paying of prizes to the A1 aristocratic animals which, perhaps, have not raised their own calves, although, no doubt, the progeny of those animals make more money for the fortunate owners than the same number used for dairying only, but it is not every one who has a plethora of this world's goods to enable him to indulge in high-priced cattle, and have to do the best they can with the more ordinary ones, which individually are not worth so much. I have also of late taken more interest in fat stock at our fat stock shows than in dairy cattle. After considering the matter I came to the conclusion that the old hackneyed text of "Cows for the Dairy," could once more be touched upon, following the old adage, "that you cannot get too much of a good thing." The term dairy cow is of necessity an indefinite one.

To the farmer who lives in a rough hilly country, she must be light and active, while to the one who lives on the level meadow countries these qualities are not desirable. To one whose location makes stock-raising unprofitable, size is of no material consequence provided she yield a profitable return for the food given her, while to the farmer who wishes to send his hay, grain, and turnips to market by feeding them to her, size is of vital importance.

To the ordinary farmer or dairyman who does not care to milk his cows in the winter it is desirable that she give milk six months in the year, while to the man who runs his dairy, as he would any other business, for the greatest profit, she should give a good flow of milk for ten months.

A good dairy cow can be described in general terms by the following quotation:

"1. Nature has given her great vitality, perfect and well-balanced organs, and preserved her in the highest healthfulness.

"2. Her digestive and assimilative organs are of the largest capabilities.

"3. All the food digested above what is required to maintain the animal in health and full vigour is converted into milk.

"4. The disposition, the size and symmetry of the animal, the form of the udder in regard to the labour of milking, is of the most desirable kind.

"5. As a part of the financial consideration, the animal in style and colour is a creature of beauty, and possesses such purity of blood as to be able to transmit all her excellencies."

The question now arises how are we to find such a cow? Is it from any particular breed or breeds, or is it from particular families of any breed? I am thoroughly impressed with the idea that it is from the particular strains of all breeds that we must look for the cows for our dairies, no matter whether they are Shorthorns, Ayrshires, Holsteins, Jerseys, or their grades.

When you do find such cows in your herd take care of them and buy pure bred bulls from the best milking family you can find, whose dam, grand dam, and great grand dam, and as many generations as possible that have been proved to be good milkers in fact as well as in theory, not losing sight of size; if you live in a good grazing country a few dollars on the price of such an animal need not be any objection. No doubt many of the farmers in this section of the country have just such herds of cows, as it is now many years since the factory system of cheese-making was first introduced here. One of the reasons for slow progress in getting a good dairy herd is that the average farmer is often hard up, and is tempted to sell his best cows for a good figure and keep his poor ones, and he sells his fattest calves, consoling himself with the plea that dairy stock should look slim, showing that the tendency of the calf is not to beef. Another reason is that the average farmer does not know precisely how much milk each of his cows gives, nor the quality, which no one can do without the test of the scales, which means system and work.

The milking or dairy properties of the different breeds has always been a matter of much discussion, and it would be extremely difficult to find a unanimous, perhaps not a general, acquiesence in any opinion. In this country the breeds best adapted to the dairy are the Shorthorns, Ayrshires, Jerseys, Holsteins, and the grades and crosses of these four distinct breeds. Some of the Herefords, Galloways, and Polled Angus, no doubt, are good milkers, as doubtless they have the milking strain more or less, but they are more noted for their beefing qualities, and are not generally owned in this country, so I will confine myself to the other four well known breeds.

Shorthorns.

I shall commence with the Shorthorns, and must preface my description of them by stating that I was brought up a Shorthorn man, and with the exception of Ayrshires have had no experience with any other class of cattle.

A Shorthorn in perfection is of large size, fine boned, of great weight, and comes to maturity early, while the beef is of the best quality. There are two classes. One class milks well, and the other class beefs well. Both classes require good pastures. Nearly

every farmer that has a Shorthorn herd has noticed this; it is very marked in our own herd. Out of two heifers imported in 1845 for my father, the Adeline Tribe were of the beef and show class, while the Lady Eden tribe were great milkers; and as long as we kept the herd, until the fall of 1879, the same qualities adhered to their descendants. Lady Eden having more female descendants than the other, her stock is more scattered over Ontario, and I always hear the same account of her progeny, which shows that the female has a great deal to do with the milking inheritance.

The Durhams or Shorthorns are descended from the Yorkshire or Teeswater cattle, and they were noted for being good milkers, and having large frames. The Teeswaters originally came from Holland, and brought over because of those two qualities. The Holland cattle had short horns, and no doubt in old times, crossed with the Teeswaters, gave us the present race of Shorthorns. At the first nearly all the Durhams were good milkers; the original Duchess, of Mr. Collins, gave fourteen quarts at a milking; since then the two classes have diverged, one encouraged for beef is doubtless the larger class, while the other continues to milk well. It is hard to say which is the more valuable. The Shorthorn bull makes a splendid cross on nearly any kind of cattle, and has worked marvels on the common or so-called native cattle, so that in this locality few of the latter-named breed are to be found.

I do not say common or comparatively worthless cattle cannot be found, as I am sorry to say, in the midst of the best of herds; some miserable farmers are so indifferent or penurious, that they will not pay the trifle required for the service of a neighbour's bull. I have known some of this class take down the fence at night, shewing that it was penuriousness not ignorance, that was the cause. My father commenced with the common cattle of the country; but my grandfather, who was a Yorkshire man, got a Durham bull in 1837, called Forester. He found him up Yonge street at a Mr. Simpson's, who imported cattle very early, but did not know how to keep them. It took my grandfather a week to drive him home seventy miles, and he took good care to arrive with him at night, but he knew he had a treasure, and this same bull made a revolution in the neighbourhood in cattle-raising.

My father soon got another called Cleasby [129], and in 1845 our first importation was made.

Ayrshire Cattle.

This useful breed of cattle originated in Ayrshire, Scotland. It is the opinion of some that they are pretty much the same breed as the Durhams, however they may approximate each other in crossing, as races. I believe them to be as distinct as the Shorthorns and Devons; it is easy for an expert to discern the difference. They are considerably smaller than the Shorthorns, much lower in the leg, with larger bodies in proportion to their size, shorter, with finer limbs, their face is not quite so long nor so tapering, their colour somewhat that of the Shorthorn, though with less white, not so clear, more of the roan, which makes some Shorthorns so beautiful. They are often spotted with white, like flakes of snow. The red is as bright, but more of a yellow. They are thrifty, but do not take on the same condition as Durhams, especially when in milk. When dry they feed well, and their beef is of good quality, but they are valued chiefly for the dairy. A fine Ayrshire cow with her full udder is an object for a painter to study, and makes a fine picture. At our last Provincial Exhibition in Ottawa the Ayrshires were the only ones that competed for the milking test; even the Jerseys were not pitted against them, this I consider to be a huge feather in the cap of the Ayrshires. A great fault in the average Ayrshire is the shortness of the teat, which is very objectionable to a milker. Care should be taken in breeding these cattle, to try and develop greater length in this important organ. I noticed that the herd exhibited in Ottawa by Mr. Drummond, of Petite La Visitation, and which took the highest prizes in the milk test, had better proportioned teats. A celebrated writer on dairy husbandry in Scotland says that "there are thousands of the best Ayrshire cows which, in their best condition, and well fed, will yield four thousand quarts of milk per year, and produce three hundred and seventy-five pounds of butter each, and that in a dairy of sixty cows, every one

yielded her own weight annually of the best cheese to be met with in Scotland." I hope he was not romancing. Cows of this breed have been known to give fifty-four pounds of milk in a day, and a three year old heifer, twenty-eight pounds a day for six weeks. When fed and slaughtered the beef of this breed of cattle weighs from five hundred to twelve hundred pounds The Ayrshires do well to cross with Shorthorns, and not Ayrshire on a Shorthorn; we tried that once on our herd, used the Ayrshire bull on Durham grades, for two years, and made an awful mess of our cattle. It took several years with Shorthorn bulls to get back the size and docility. The Ayrshire blood made them wild and hard to milk, the Ayrshire grades served by a Shorthorn bull brought very satisfactory stock. The Ayrshires will thrive better in a hilly country than the Durhams, and are not so expensive; I wonder they are not more generally used, as by careful breeding, a herd of them for the dairy would be difficult to surpass. An Ayrshire cow, Duchess of Smithfield, owned by the late William Watson of Long Island Sound, gave in one year 8,760 pounds of milk. The average of Mr. Miles' herd of Fitchburg, Mass., of ten cows for five years, was 2,642 quarts or 660 gallons. The average of Mr. J. D. W. French of Andover, Mass., of sixty cows for six years, was 2,660 quarts or 665 gallons.

The greatest objections I had to Ayrshires, while in the dairy business, were the short teats and nervous disposition, very likely they are not all of this temperament, mine were from the Morton stock.

Jersey Cattle and their Grades.

These are a class of cattle that I have had no experience with, but they must be excellent milkers and butter-makers, or they would not be so celebrated. I should think they would be better fitted for gentlemen who only want two or three cows for the use of the house, than for regular dairies, but doubtless their grades would make good dairy cows, and could be raised without great expense. I notice the record of fifteen Jersey cows, two of which were aged and three heifers, owned at Houghton Farm, New York, which averaged 5,844 pounds of milk in a year.

The butter properties of this herd were calculated to be forty per cent better than those of ordinary cattle. Our own countryman, Mr. Valencey E. Fuller, from one cow, Oakland's Cora, made, four months after her calving, eighty-one lbs. five and one-half ounces of unsalted butter, in thirty-one days, from 725 lbs. of milk, and nineteen pounds, nine and one-half ounces of butter from 169 lbs. of milk, in seven days, by an official test; this is wonderful. Another cow of his, Mary Anne of St. Lamberts, was tested for eleven months and five days and gave 8,470 lbs. of milk, which made 857 lbs. fourteen and three-quarter ounces of butter; this cow also in one week gave 245 lbs. of milk, making thirty-six pounds twelve and one-quarter ounces of butter, this is marvellous. Another of his cows, Naiad of St. Lamberts, in seven days gave 267 lbs. of milk which made twenty-two pounds, two and one-quarter ounces of salted butter.

A weight of a Jersey cow at maturity is from 800 to 1,000 pounds. Bulls have been known to weigh as high as 1,600 pounds, so that you see the beef properties are not counted, although grades have been known to beef well. The Jersey's merits must be taken as a butter cow.

Holstein Cattle.

This is a comparatively new breed in this country, but one, if I am not mistaken, which will take a prominent stand for the dairy. Not having had any experience with this class either, I cannot do better than quote from a sale catalogue of Peter C. Kellogg & Co., of New York, which gives a terse summary of the claims made on their behalf:—

"As a breed they are undoubtedly, by far the largest milk-givers in the world. Occasional instances are recorded, wherein single cows have produced forty quarts of milk in a day, and even higher yields have been reported, while it is no uncommon thing for entire milking herds to average over twenty-five quarts a day for several months in the year.

The milk is particularly rich in caseine (the most nourishing elements of milk), and consequently remarkably well adapted to cheese-making. It is not as devoid of cream as many people have supposed, but its organization is such as to prevent it from parting with its cream as readily and copiously as is the case with the milk of some other breeds,

Hence the milk, after skimming, retains a large share of richness and nutriment, and has not that blue, watery appearance often seen in the skim milk of the exclusively butter breeds. By churning the whole milk some very large butter yields have been obtained from Holstein cows, occasional instances running above three pounds a day. This non-separating quality renders Holstein milk the very best for supplying towns, as it is the more proof against injury by transportation. Holsteins are very large cattle, and when dried off, fatten so rapidly and profitably that in addition to their unrivalled dairy qualities they closely approximate the Shorthorn standard as beef animals. It is confidently claimed for them, that for combined adaptation to milk, beef and the yoke, they meet all of the several requirements more fully and successfully than any other breed. Hence it is assumed that apart from form, the fashionable demand which is so rapidly growing in their favour for breeding purposes, and which in all breeds must necessarily abate to some extent, as the supply increases. Their perfect adaptation to a variety of uses will render them, under varying conditions of market, the most permanently popular breed of cattle in all parts of the country where mixed husbandry prevails. They can compete respectably in any, specially with any other breed, while in their own chief specialty—that of enormous milk yield—they can drown any other breed.

A celebrated Holstein cow, Mercedes, now dead, in a trial of thirty days, gave 99 lbs. 6 ounces of salted butter. S. C. Stevens, of Attica, N. Y., states that his cow, Echo, gave, in 365 days, 18,100 lbs. of milk. I have endeavoured to give you characteristics of four different breeds of cattle; of course the yields of milk quoted are from the best animals of the different breeds. I have not given any tests of Shorthorns, not having any records of value of that breed, but can only say from my own experience, that the milk strain of this noble breed is a good one, and my experience was, that to have good calves, I had to raise them myself. You cannot depend upon buying them, and the only test of a good milker is the scales. Many a cow that fills a pail to overflowing just after calving, does not keep up that record, and others that do not do as well at first spin it out all the season, and the yearly average is better than from the first-named. Another thing I may say before concluding, that to have a successful dairy, you must provide well for it, have plenty of pasture and plenty of green feed to cut for the cattle during the dry weather, and do not forget the shade for the beautiful animals to lie under and chew their cud. The motto of a successful dairyman must be "watchfulness"; he must have his eye on everything, be always raising new stock and culling from his old.

There is no other way of making the business a success, but after all he has his pleasures. I can assure you, gentlemen, that I miss the daily visit to the cattle since I came to the city to live, more than any of my other duties on the farm. The dairyman must not be discouraged by apparent non-success at first; he will eventually reap his reward, if not by the price of his butter and cheese, by the increased fertility of his farm.

We commenced cheese-making about 1864. Our farm was at that time reduced by grain-growing. From keeping twelve or thirteen cows we increased our herd to forty milk cows and twenty young cattle. In a few years a marked difference could be seen in our crops, and ten years afterwards when we reduced again, it was marvellous the difference in the yield of grain. Our farm, which was situated between Port Hope and Cobourg, was not naturally a grazing farm, but we kept up our feeding during the dry months by soiling, and found it answered well, that the flow of milk was kept up until the aftermath of grass appeared. Thanking you, gentlemen, for your attention

HENRY WADE,
Toronto.

DISCUSSION.

Mr. RICHARDSON.—Mr. Wade, have you any Holsteins?

Mr. WADE.—No, sir.

Mr. Alexander Lobban, of Michigan, upon being called to the platform by Mr. Richardson, said he was not a public speaker but had been brought up chopping and

clearing lands. In his early days he introduced milking in Genesee County, Michigan. He said by taking their common cow, brought up on the commons of Detroit, and breeding with others brought from Connecticut, they obtained good milkers, some of them giving sixty-seven pounds of milk per day.

Mr. CHADWICK.—Were they all native cattle?

Mr. LOBBAN.—They were. They all nearly equal the Holstein in quantity. These I speak of have been bred for forty years and are hard to beat.

Mr. WADE.—What bulls were used?

Mr. LOBBAN.—We were careful not to drive to Durhams; only in one instance was it done, and he was a good one. This was done to get more size, and I do not think they lost any of their milking qualities. These Holsteins are large, open-built, open between the ribs, broad, sharper on the hips, and they are large eaters. They are the largest eaters I ever saw. I have seen many of them give seventy-five and eighty pounds of milk a day, and have weighed it myself and know. We have records of 110 lbs., 2 oz., by a cow now in Jamaca County, N.Y. You can milk them to death on bran and clover: but, to keep up their vitality, you must feed them a certain quantity of oats. He then referred to a cow that gave, in the month of June last, 2,117 lbs. 6 oz. of milk, milked three times a day, but after eight months she died. Her first living calf, got by an animal out of a wonderful butter family of Holsteins, and now four years old, is the richest milker he had ever had any experience with. He thought, on the whole, the Holsteins were the largest milkers, and will produce the most cheese; but they are also the largest eaters. His Holsteins generally drop a 100-pound calf when the cows are four or five years old. He saw, at Mr. McGraw's, Bay City, Michigan, a calf that weighed 134 pounds. Some of the animals in Michigan weighed nearly two tons.

Mr. RICHARDSON.—They are quiet, are they?

Mr. LOBBAN.—Yes, sir. I have read a book printed in Germany. It goes away back to the time when Germany was inhabited with clans and tribes; and from this book I believe I can tell you how the Holsteins were produced. They took the cattle in Holstein (Denmark) or along the whole line of Denmark, and crossed them with the Saxon and thus produced the varied colour of black and white. They were bred in-and-in for 300 years, and so established the Holstein cow. The object that induced them to raise a cow for milk was the high price of butter and cheese in London. They have been at it over 1,500 years, and produced by careful breeding an animal profitable for butter, cheese, and beef. A Professor in the Agricultural College, Michigan, in summing up his experience with the Holstein cattle, says that they have the basis of three good qualities; that is, beef, butter and cheese. The cow, "Mary," that took the first prize at Paris Exhibition, now owned by parties in Michigan, gave ninety-two pounds and some odd ounces in the hands of the committee at Paris for some seven or eight weeks—a very large yield. No person would be mistaken in looking at the cow. She showed her good qualities. Her skin was thin and as yellow as it could be, and she was of wonderful capacity, weighing 1,600 pounds when I saw her, and yet she was thin at that. These German writers do not recommend raising heavy cattle on light or sandy land, but say that breeding large Durhams on light or sandy land will, in the course of time, diminish them in size. To have a heavy animal you require heavy soil.

Mr. WADE.—You must feed the machine?

Mr. LOBBAN.—Yes, sir.

Mr. WADE.—Could not you keep three Ayrshires where you keep that one cow?

Mr. LOBBAN.—I do not think so. I am satisfied the Holstein is far ahead of everything. I have got a calf that increased in weight 100 pounds per month. It would surprise you the amount of hay he eats. They are remarkable maturers. The second calf when two years nine and a-half months old, weighed this fall 1,880 lbs., and is not fat either; and there is one that beat him over 200 lbs. One animal got by Nicholas and the cow I just spoke of weighed 2,210 lbs. when two years ten months old. Nicholas, when not quite three years old, weighed 2,350 lbs. I saw him when in Bay City—he is

now in Wisconsin—and he is bred in the same line as the cow "Mary" that took the prize at the Paris Exhibition. I think when you get a good animal, the best thing to do is to keep them and raise heifer calves. I think the Holsteins have the advantage, having had the care of nearly 2,000 years. It is uncreditable the amount of milk they will give. The cow that beat the world lacked two ounces of 1,100 lbs. in a year. They will stand more heavy feeding than other cattle. When feeding my cow for milk I gave her about two quarts of barley meal night and morning and she got thinner under that treatment all summer—nothing apparently but skin and bones; and I then turned her out to the strawstack. I think I have been milking too many cows, and find it uses them up too much. Making cheese is far more profitable. We can only get eleven, twelve and thirteen cents per pound for our butter, and they want to give trade for that. I have known good cows spoiled during the winters by not keeping the udders milked out now and then to keep the sediment from settling in the teats. This will occur in some of the best cows.

Mr. SPEARS.—With regard to the cows that have been fed the season through upon good clover and given so much chop corn per day, when you turn them out to the stack, did not they go down?

Mr. LOBBAN.—I wanted them to dry right up, and did that intentionally.

Mr. SPEARS.—Did you begin to feed up about a month before the cows came in, or leave them at the strawstack?

Mr. LOBBAN.—I would feed them on red beets and a few boiled oats about ten days, and do so until about ten days after they came in. Ninety-nine cows out of a hundred will come in all right if you feed red beets ten days before coming in.

Mr. CURTIS.—Did you trace the pedigree of your excellent cow back to Holstein?

Mr. LOBBAN.—Yes, sir.

Mr. CURTIS.—When they are in the north of Holland they are called "Dutch Friesan" cattle. The black cattle in the north of Holland, with large bone, crossed with the milk-white cattle with small bone, favourably known for their milking qualities, produced the breed of cattle called Holsteins as we now find them. My observations are that the best milkers of the Dutch Friesan cattle are those in which the white predominates.

Mr. Shaw now read his address on "The Possibilities of the Dairy Cow."

THE POSSIBILITIES OF THE DAIRY COW.

By THOMAS SHAW, ED. *Live Stock Journal*, HAMILTON, ONT.

No man in this assembly will for a moment question the importance of the subject which forms the basis of this paper, but many even of the leaders in this vastly important interest may never have sufficiently considered it.

The possibilities of the dairy cow: Who, after the prodigious feat of Mary Anne of St. Lambert will take upon himself to say what these are, who shall be so rash as to plant the landmarks permanently or to draw the final boundary lines?

We shall not hazard the attempt, but simply present to you as concisely as we can, the little basket of first fruits that we have been able to gather hastily on the outskirts of this almost unexplored vineyard.

The first question that naturally meets us on the threshold of our argument is this, *Can the standard of the average dairy cow be permanently raised?* and the second, an offshoot therefrom; if so, *how shall this be done?*

To the first question we give unhesitating answer, *it can.* To what extent, you ask? We reply, about *one hundred per cent.* in the near future.

In days more remote we cannot say how much more.

The report from the Bureau of Industries for 1883 gives 2,784 pounds of milk as the standard for the average cheese-producing cow of Ontario for the season, the average duration of which was 156 days.

Mr. D. M. McPherson, of Lancaster, assures us that the standard of the dairy cow can be raised to 6,000 pounds per season, and surely, owing to the vast extent of his dairy and his experience in it, his opinion is of much worth. He tells us that the standard cow per season in the Glengarry section was formerly 2,000 pounds, but that since the farmers there have felt the gratifying impulse of the stirrings of the cheese industry the standard has advanced to nearly 3,000 pounds per season. Professor Wilson stated at the opening of a class for agriculture in November, in Edinburgh, that in a few years the milk produce might be increased from 500 to 1,500 gallons a year. These are certainly splendid possibilities.

The very mention of them must create stirrings of impulse within the breast of every dairyman who hears them, and why should they be thought incredible?

Man has been endowed with a power of modelling and re-moulding even in the animal creation, that is little less than Divine.

In this respect creative power alone is denied him, in the sense of originating out of vacuity. Evolution follows in the train of his efforts, such as must have astonished Darwin himself, but it is evolution that results from the plastic application of the powers of intelligence operating on matter, and not from any hidden inherent forces that even animated matter may possess. Confront an ancient Briton of the Teeswater region of one thousand years ago, as he roamed about through darkening forests, clad in the skin of a bullock not much larger than himself, with one of those ponderous productions of the same land which weighs nearly two tons, and what would be his astonishment? We can fancy the man who would fight the sea kings of the west running away from the gigantic spectre as some monstrous production of the angry Gods.

Present an Ayrshire clansman of the same period a modern Ayrshire cow. In those old days he could himself swallow at a single draught the milk product of his cow. The Ayrshire cow of to-day would give him all his desire at one milking, and satisfy the wants of his "guide wife" and "bairnies" ten, and also leave a little for a "neebor's" sick child. The native cow of the prairie only suckles her offspring for a few months.

By the moulding process referred to her progeny may in time be made to milk at least ten months in the year.

See the advance that has been made in other live stock lines. In 1719 the average weight of horned cattle in London, England, has been given as 370 pounds, at five years old. We presume the above was dead weight. At the present day in the same market the average dead weight at the same age (dressed), and from the same source, cannot be less than *three* times that amount.

Why, then, should we not believe that the average dairy cow for the season will not be able to produce at least 5,000 pounds instead of 2,784 pounds as at present?

We say 5,000 pounds, as, though we do not doubt the correctness of Mr. McPherson's statement when he speaks of 6,000 pounds, we choose the lower average in the meantime, as more likely to catch the ear of the average dairyman. If the standard is fixed so high as to shake the credulity of interested parties, all hope of reaching them by way of inciting to higher effort is lost. In this way we can fancy the owner of Mary Anne almost wishing that gigantic record had not been so high, since it has led grave thinkers on both sides of the ocean to shake the head as to the correctness of the record of this wonderful performance, unique in the history of dairy cows.

Taking 2,784 pounds, the figures given by Mr. Blue as the standard cheese factory cow of 1883, and the returns from these as he gives them, we have the handsome revenue of $3,396,822.21 from cheese made in factories alone. But suppose the standard cow the same season had given 5,000 pounds, the returns from the same 266 Provincial factories would have been $6,100,721.64, or a difference of $2,703,839.43. To produce a similar sum from the 2,784 pounds per season cow the number of cows must be increased from 117,577 to 211,165, thus requiring an additional outlay of capital invested, additional cost of feed, and additional pay for attendance and milking.

We cannot believe that the 19,797 patrons of cheese factories (the number in 1883) will allow this sum to lie ungathered, as the price of *indifference* in regard to the possibilities of the dairy cow. This sum divided amongst these would give each of them $136.56, almost enough to give one son in every family the benefits of a higher education

for a whole year. Mr. Blue gives the average returns of each cow per day as 18½ cts. from the cheese factories, produced by the 2,784 pounds per season cow. The 5,000 pounds per season cow would swell this sum to 33,225 cts.

Multiply the difference, 14,725 cts., by 710,519, the whole number of milch cows in Ontario in 1884, and we have the magnificent increase of $10,452,392.27, on the supposition that the standard cow in the private dairy is not superior to that in the cheese factory roll, and that she is quite as susceptible of improvement. Men bewail the rich stores of money that are left to lie ungathered in the beautiful fields of Ontario.

How much more should we bewail the cargoes of butter that are not forthcoming, and the rivers of milk that never flow, and the millions of money distributed in other lands, because of the low standard of the dairy cow with which our countrymen are content. The calculation in both cases is for only 156 days in the year. Extending the duration for a longer period, which is certainly legitimate, would still further swell the revenue.

The capabilities of the leading dairy breeds in this country have not as yet been determined by way of test, unless in a few isolated instances.

Mr. Thomas Guy, of Oshawa, a leader of the Ayrshire interest in Canada, has done something in this way. In 1882 his herd, which won first prize at the Provincial, Kingston, as best herd of five cows for general purposes and profit, gave him an estimated aggregate of milk each for nine months in the year of 7,290 pounds, but as the milk was not weighed daily the estimate is only an approximation, though most likely a close one. This furnishes one instance of the possibilities of one Ayrshire herd of cows in one year. Allowing for the larger amount of milk given during the first months after calving, this brings us to the 5,000 pound cow for the cheese-making season.

As regards Holsteins, lengthened tests have not been made in this country, owing to the recent introduction of the breed here. We are indebted to Smiths and Powell, of Lakeside Farm, Syracuse, N. Y., who came to be the most extensive owners of this breed of cattle in America, for information in regard to them. For some years past those gentlemen have kept records of their entire herd with the utmost care.

In 1881 the herd of matured cows averaged 14,164 lbs. 15 oz., and the two year heifers 9,711 lbs. In 1882 the entire herd of eight three year olds averaged 12,388 lbs. 9 oz. On April 1st, 1884, ten cows of this herd had made records of from 14,000 to 18,000 pounds each, the average being 15,608 lbs. 6 3-10 oz., which included every mature cow in the herd that they had owned long enough to make a year's record, except one kept for family use.

They represent glorious possibilities, even though coming from choicest specimens of the breed, no one will think of using the famous little Jersey in the cheese-factory, but in the creamery we really cannot do without her. Thousands of Jersey cows make their standardrecord of two pounds of butter per day, a story well accredited by the A. J. C. C. Reg. Indeed, our townsman Mr. Valancey E. Fuller has demonstrated that the entire Stoke Pogis family, so far as age has admitted of their being tested, have come up to this standard, to say nothing of the almost fabulous record of Mary Ann of 36 lbs. 12¼ oz. in seven consecutive days, and 867 lbs. 14¼ oz. of butter in eleven months and five days. Not forgetting that there is but one Valancey E. Fuller, and but one Mary Ann, of St. Lambert, the thousands of standard Jersey cows in the United States and in other lands abundantly demonstrate the possibilities of this breed.

Then the Shorthorn, as a dairy cow, must not be hastily pushed aside. She is the only cow, so far as we know, that answers fairly well for both dairy and beefing purposes. Yet allow me to ask whoever yet saw a very fleshy Shorthorn cow that was at the same time an abundant milker?

It is just possible that the sooner dairymen cease to make large account of the value of their pets as flesh-producers the better. As observation at least has taught us that large milk production and great flesh production at the same time are impossibilities. The great question with dairymen is, the *greatest in milk, butter or cheese, at the least outlay for keep*, and till some one will tell us which of the breeds will best fill the bill in this respect, we feel that we are yet in the alphabet of that book of research that will one day answer this question.

At the recent British dairy show in London, England, the champion prize (quantity

and quality considered) as best milker was given to a Shorthorn cow not eligible for registration. Mr, F. M. Watson, of Roseville, Ill., has just called our attention to a record of 10,619 pounds made by one of his Shorthorns in nine months, so that it is clear that this breed are no mean competitors for dairy honours. The best breed of cattle for any purpose in the abstract, who as yet will take it upon himself to say ; even in regard to the beefing breeds, who shall tell us which is absolutely the best?

It would be correct to say that Shorthorns have hitherto proved themselves the general-purpose breed in this country, but this does not determine that so it shall be always. Our experience here in other breeds has been somewhat limited, hence we dare not pronounce with absolute certainty how it shall fare with them in coming days. It may be that some of the newer introductions will send the Shorthorns to the wall, or at least force them to share their stanchions. Some new breed may come upon the arena in the days that are at hand and take possession of the land.

The world still moves. Only yesterday we looked upon a new breed of fowls that are first being propagated in Ontario, and for which we expect a hopeful future.

They originated in New England, and, along with Mr. John Dimon the originator, have been removed to Walkerville, Ont. They are called the "Dimon Creeper," and are very beautiful specimens of the Plymouth Rocks, supported on the short legs of a duck without the web-feet. We are thus reminded that in treating of the live-stock industry, we treat of a subject that is endlessly progressive, and in regard to which we should draw conclusions with the utmost caution.

Similarly, as to the best breed for dairy purposes, we look upon that matter as undetermined. The man who takes upon himself to say that any one of the existing breeds is absolutely the best is certainly chargeable with temerity. It may be very proper to say that one breed *has* proved itself the best for butter production, and that another breed excels for cheese-making purposes, but that is different from saying that it is the best. Some of the dairy breeds have fallen into the hands of men of great enterprise, and hence their capabilities have been more fully developed and more accurately ascertained than those of other breeds, while in nearly all the experiments and tests that have ever been made, we have had no full account of the amount and kinds of feed given, which is a great misfortune. Hence, with all the testing and with all the advance that has been made, we are still floundering amid the sands of uncertainty, lured by what may prove a deceitful mirage. It is certainly important to know the possibilities any breed or cross of dairy cattle in their individuality, but it is of far more consequence to ascertain their mean value for any purpose.

With all that has as yet been done by way of testing, where is the ordinary dairyman who has given us the mean average of his herd? That one animal of a breed is capable of such and such things settles comparatively little conclusively as to the general adaptability of the breed. Nature sometimes produces prodigies both amongst quadrupeds and bipeds.

We remember a magnificent specimen of an ox on my father's farm years ago that could not have had one drop of Shorthorn blood in his veins, and yet he had all the docility of temper and dimensions of carcase possessed by this magnificent breed, only put together after a very different fashion. We called him "Dun" after his colour. Now "Dun" was only a scrub, though unlike his brethren, in appearance and temper. To argue that the scrubs were a magnificent breed of cattle, from this one fine specimen that they had produced, would be very unwise, hence to conclude that because one or two animals of any breed have achieved such and such results, the entire breed was admirably adapted for a similar purpose, would certainly be unsafe. When here and there in different counties and under different management, individual animals of the same breed distinguish themselves by their dairy product, it certainly strengthens the argument as to the capabilities of the breed. Yet it is the averages of the herd in ordinary dairies that will better determine which race of cattle is best adapted for dairy purposes. It is, therefore, of the utmost importance that a record of the product of every dairy be kept, that an average for the season be struck, and that amongst the dairies producing the highest average, inquiry be made as to the breed of the cattle, the quality of the feed, and the method of feeding. Of course in the cheese-making season the cows are mostly out in

pasture, but pastures even differ in their composition quite as much as fodders in the winter season.

In this way there would be no great difficulty in ascertaining the capabilities of the present races of dairy cattle where extensively used, and hence securing an approximate idea as to which are the best for the ordinary dairyman. But we shall never rest content till this battle of the dairy breeds is fought out. If one breed is better than another for producing butter, creamery men and private dairies should be in possession of this knowledge. If one breed will give more milk than another in quantity, dairymen who supply the towns should know it. If any one breed can distance all comers in producing cheese, all cheese dairymen should know it, and if any one breed is better than any other for both milk and butter production, 200,000 farmers in Ontario should know it. As yet we are in the jungle, and who will show us the way out? The Jersey breeder says, "I will show you three Ayrshire shouts, follow me." The Holstein owner cries, "this way." The proprietor of scrubs forlornly shrieks, "I know a short cut," and the Shorthorn man says, "come with me, my way is the best." We are strongly inclined to think that none of these men will determine this question, if ever it is determined. It must be done by some disinterested party. We think that Professor Brown and the Experimental Farm could soon build a highway through the jungle if they only would, and it would certainly be good employment for them.

As suggested by us more than a year ago, would it not be money well spent to have a test of the different dairy breeds at the Experimental farm, and extending over a term of three years at least, or four?

Let butter be made in the winter months and cheese in the summer, and an accurate account of quantity and quality of milk kept as well, along with the nature and amount of food consumed. The cost and selling price, along with the progeny returns, might be considered, if thought best. We do not know of a more important work that could engage the attention of a Governmental School. We claim that we have shewn that the standard of the average dairy cow can be permanently raised, and to such an extent that it is unsafe to fix the limit of the advance that may be made. We now take up the second question. How shall this be done? We answer: *first*, by continuous breeding only from the best, and by constant selection from these, and *second*, by keeping private records in every dairy, from which animals are bred, without which the above course cannot be accurately determined. There are but two ways of keeping up a full supply of dairy cows worthy the name. One is to breed them in the dairy, the other is to have them bred by professional breeders. A third source of supply is to buy them up promiscuously, which cannot be done without bringing in from time to time a great many useless weeds. The men of Holland have shown much wisdom in their method of breeding dairy cows.

We are told that in every herd of registered cows, a private individual record is kept, so that the exact value of every cow is determined from the first, which affords the owner a certain guide as to her exact commercial worth. Animals with low records find their way to the shambles, and only the best are bred from, hence there is gradual improvement *all* along the line.

The watchman is also careful, scrupulously so, as to the bull he uses; unless from a dam with a large milk record, and possessing individually in their minuteness, the points of a dairy bull, Hans will not allow him to head the herd.

While he leisurely smokes his pipe by the shores of the Zuider Zee, smiling over the handfuls of gold that Americans bring him every year, let our dairymen in Canada slip a leaf out of his book, and adopt his principles.

Good dairy cows can be bred on the banks of our own Thames and Sydenham, as well as on the banks of the Scheldt, if bred on similar principles.

We have never known an instance of professional breeding for the ordinary dairy in this country or in any other, but we fail to see why a large field of enterprise here is not opened up to some energetic parties with a little capital. In this way we can conceive that a far higher standard class of cows might be furnished to our dairies, as purchasers would most likely be willing to give a price proportionate to the recorded yield of the cow. Where calves are raised in the dairy for future supply, it would be very unwise to save any that are not from cows with the best records. In this way, on the well-

established principle that "like begets like," the standard of the dairy cow would be speedily raised. The advantage of keeping records is so apparent that the only wonder is that the practice has not become universal. To keep a cow from year to year that gives but three-fourths of the return of another in the next stanchion is very unwise, while both consume, it may be, an equal quantity of feed.

Records of individual dairies in the aggregate, are, of course, kept in the factories, but so far as we are aware, no use has been made of them, by way of determining which is *the* dairy cow. We do not see why in this way we are not furnished with a key that opens the door into this wide field of investigation.

We are a little surprised that our dairymen who have shown such laudable enterprise in many departments of their work, have not given more attention to this part of their enterprise. They have insured a uniformity of product that brings from one-quarter to one-half of a cent per pound more than that manufactured by our worthy brethren across the line. They have transformed the chaotic mass given into their hands, but a few years ago, into one of the most gigantic, and we believe by far the best regulated industries in the land, and yet, like men who have cut away all the cataract on the river, and made it navigable all the way, they have left the fountain head encumbered by *debris* in their comparative inattention to the improvement of the dairy cow. Prizes offered by somebody, and at some suitable time and place for herds with the best record for the season, would doubtless draw more attention to the subject. The quality and quantity of the feed used will be found important factors in raising the standard of the dairy cow, but we cannot speak of them now.

We conclude then, that we have shown approximately the possibilities of the dairy cow, and some of the methods that must be considered in permanently raising her standard. We have it somewhat clear that golden nuggets line the pathway that we have been tracing. But how shall dairymen be made to see that enterprise in this direction is worthy of the effort?

We have little doubt but that the average dairyman will look upon our statements as those of some newspaper man who never handled a dairy cow. (A great mistake, many a time we have handled them, and many a time they have handled us, in breaking them in to milk. As the pleasant pictures of a dreamer, and hence, like the old man in the bewitching story of the immortal tinker, who heeded not the golden crown that was suspended above him, they will make but little effort to secure the nuggets. How shall they be persuaded? This is a great question, one that might well stir the whole atmosphere of the political horizon. Where is the Canadian Ulysses that will grasp this Ajax Telamon, and throw him on the earth? It is humiliating to think that men who grudge both wife and child a full share of the comforts of life, will throw away the keep of a cow, for one-third of a year at a time, and through all the times and seasons of their business life. This is not a question that affects cheese dairymen alone, but nearly every owner of the 710,519 milch cows in Ontario, from the Glengarry Cheese King of the Continent to the cottager's single cow that fills the porringers of the olive plants that surround his table.

There are but two remedies, so far as we can see: The first, is to reach those parties through the medium of the press, and teach them better; the second, is to convince them by actual demonstration. Both of these are hedged in with the walls of difficulty, higher and broader than those of old-time Babylon, but yet they can be scaled. What is more difficult than to reach the 300,000 farmers in the Dominion who take no purely agricultural paper, and everyone of whom keeps one or more dairy cows? How shall we convince them that their standard cow will scarce half fill the bill? In this, the secular press can lend a helping hand, by publishing from time to time good sober articles on agricultural topics—far better food than the latest scandal—for both parent and child. For every farmer who takes a farm paper there are ten, perhaps, who take a local newspaper. If the editors of such were all fully alive to the importance of urging upon this class the wisdom of seeking higher attainments, it would be well. But when the dairyman is thus reached the work is but half done. It does not follow that he is convinced. It is a thousand pities that farmers are so prejudiced to what is usually termed "book farming." Who, we ask, are responsible for this? We know of no necessary inherent

law that naturally inclines him to this prejudice. We believe that the incompetent authors of book farming in the past are largely responsible. Too many men who have proved failures at other things, have settled themselves in the chair of those whose business it is to write on agriculture, under the foolish delusion that anything would answer for the benighted farmer. Hence it is that more ridiculous nonsense has been dealt out to the farmer through the press than to those of all other callings combined, and it has borne bitter fruits in the almost universal spread of the prejudices referred to. Farmers, though fettered with many weaknesses, possess largely that intuitive perception that enables them to weigh wisely the worth of an agricultural newspaper effusion, the great difficulty lies in getting them to read it. Deep-rooted prejudices are difficult to remove, more so than the boulders of the field. It is a work that, like the removing of these, can never be done in a day. What, with the jogging of the secular press, the fuller teaching of the agricultural newspaper, and, what is more important still, widening the doors a little as to the extent of what shall be taught on agriculture in our schools, we shall hope that before very long there will be one wide, spontaneous, simultaneous movement amongst farmers from Calgary to Cape Breton to raise the standard of the dairy cow. The power of ocular demonstration is very effective. Many a man will, farmerlike, slowly shake his head who reads a statement to the effect that the standard for a cheese-dairy cow may be raised to 5,000 pounds for the season.

But when his neighbour B, whose word he never thinks of doubting, calls his attention to his milk record, and when stepping over to neighbour B's at milking time, he sees his statements verified by the scales, Conviction germinates her seeds, in spite of preconceived ideas.

The keeping of those records then, for the season, must bear its fruit in each locality. Publishing some of them in the local press will spread the good news, and thus many farmers in such sections will be spurred to higher effort.

The proclamation of the achievements of prizemen as referred to, will draw attention from a wider field and the mailing of local records by individuals to their interested friends will accomplish much. If we could but convince the farmers that we seek their welfare, when we urge these matters upon their attention, a great advance would be made. If in every home they could be led to see that patriotism, without one alloy of selfishness, was the ruling spirit in this and similar conventions, it would be a great matter.

The doubling of the dairy product, or nearly so, without adding one to the number of the eaters, is surely of immense importance, and this is what we seek. Until this grand object is attained, let no dairyman worthy of the name hold his peace. Let us toil on, even though it be as with the coral builders in the sea, we reap no personal gain. The satisfaction of knowing that we have done something toward filling the coffers of others; and thereby adding to the national wealth, will be in itself a rich regard.

Mr. Craig rose and said he wished to encourage some of the other gentlemen who were more fully posted than himself to get up and take part in the discussion, and would say a few words to set them an example. The papers of Mr. Wade and Mr. Shaw fit so well the one into the other, one would think that they had had an understanding between them, and that they had arranged that their papers should be read in the order they were. Both of them are exceedingly interesting and instructive. I notice, however, one thing that is to be regretted, and that is that this meeting is not as representative of the class to which these papers are addressed especially. We have here mostly the gentlemen who are engaged in making cheese or who are interested in the management of factories. It is to the farmers, the fountain head, that these papers are so especially addressed. I take this opportunity of saying that in different parts of the Province institutes are being held at which subjects of such a nature as we have just heard of here this afternoon are being discussed, and at which large audiences assemble. We are to have an institute meeting in Woodstock this week, and I hope Mr. Shaw will read that paper of his to interest those present, as we will have a large number of farmers there to whom the paper can be practically and properly addressed. My experience has been the same as Mr. Wade's in regard to the Durhams and Ayrshires; I have tried both of them. There can be no doubt that the Ayrshire is the one for milk and cheese, but the very great fault with her is the shortness of her teats and the difficulty of milking her. It has been remarked at previous

Conventions that the breed of Ayrshires seems to have produced too many small animals. My recollection of Ayrshires in Scotland is that they are not like what they are here. They seemed there to fill the eye much better, and they are larger and also better milkers than those in the hands of farmers here, except those who lay themselves out particularly for breeding them. The county of Oxford, as well as Perth, are largely devoted to the dairying interest, and several of our leading enterprising farmers, knowing the merits of the Ayrshire cow, endeavoured to introduce them among the farmers, but very few, even of the extensive patrons of cheese factories, were inclined to go into the Ayrshire breed. They thought they were such a naughty animal, and not such an animal as they thought would be profitable for them to have. They conceived the idea that as soon as the cow was 8 or 9 years old and failed in milking, then was the time to get rid of her, except for beef. I am glad to see Mr. Shaw here, and I think he is the right man in the right place in handling an agricultural paper.

Mr. Ballantyne.--We may make the finest butter or cheese, but unless it can be made profitable we will not continue making them. It can only be made profitably by having such a dairy stock as will produce the best possible results. In Ayr, Scotland, I saw a dairy show, possibly the largest and best show of dairy cattle in the world. I never saw such a fine sight in all my life. They were all led out one after the other in the order in which they had taken prizes. Nothing is kept there but dairy stock, not a drop of blood of any other animal in them but Ayrshire. The only calves kept are those from bulls selected from noted herds and from cows that are good milkers. Dairying is carried on entirely different there from what it is here. The milk is all given to the cheesemaker and he is required to produce, I think 480 lbs., of cheese for every cow and 360 lbs. for every heifer; and his wages consists in what he makes over and above this amount. The farmer finds all the feed and does the milking. The objections the farmers find to the Ayrshires, to which Mr. Craig referred, is caused by a lack to look at them from a Shorthorn standard. If we breed to produce a dairy breed we must breed exclusively for that purpose. I do not know, but possibly the feeding of them at an early age may have something to do in producing the aptitude to fatten and to arrive at maturity so quick, which is a characteristic of the Shorthorn breed, where the ambitious have been feeding them for milk. There is too little attention paid to the question of breeding. If we would breed with any degree of certainty, we must breed only with pure males. This is one of the difficulties we find existing in this country. We have not been breeding for dairy purposes, not specially following it up, except those keeping Jerseys or Ayrshires.

Mr. Curtis.—I would use none but full-blooded males. It is pretty well understood on our side that if you breed from a grade you have no guarantee what the product will be, and the cheapest thing for the dairymen is to select a full-blooded male of either the cheese-making or butter-making family and use them on his cows; from those cows, rear the heifers out of the very best of the calves, and then breed again, if they prove worthy; but never falling back on a grade, but always and constantly using the full-blooded male, and in this way, in a few years, a full-blooded herd will be the result. I know a herd of Dutch friesans that almost doubled the yield of milk of the common stock in this manner. I understood Mr. Ballantyne to speak disparagingly of the Devons. It may be that in New England they have deteriorated, but in my county and some others they use a great many of them, and they are excellent butter makers. I have thought so much of them that I have recommended them as a cross on the common stock of the North-West. They are the most thoroughbred animals we have. There is no such animal that will produce its like as the Devon. They are entitled to be called a race of animals rather than a breed. I might mention one instance of a cow, formerly the property of Judge Knox, and after the Judge's death she was bought by a man who got from her a bull calf. When the calf was 2 years old he was used on this cow, and this method was continued for some time right along with the offspring, and he has kept on the closest kind of in-breeding and never going out of the herd for a bull, but always breeding just as close in-and in as he possibly could. He has established a breed that are almost as uniform as peas. The quality and color is about the same, and he averages from his herd of 20 odd cows four or five heifers that give 300 lbs. of fancy butter each year, and as well as from

each cow, except what he keeps, a hundred dollar calf. This is the result of his 30 years' breeding, and he has made himself very comfortably off. They are all now black and white, with sometimes a spot on the side. When he first began breeding them they were pale red and white. The red began to deepen until it became brindle, and then brown, and now they are nominally black and white. It is said by many to be very dangerous, this in-breeding; it is, perhaps, a little more risky than crossing, but no danger comes of it if they are all right. Of course, if there is anything wrong about them you will intensify those points. If you cross two animals with the same weak points you will exaggerate that weakness and run them down hill; but if all are strong they will improve. I think this case I mentioned is one of the most remarkable; but it should be remembered that the Ayrshires and Herefords were originated by in-and-in breeding, and the Devons, so that really we seem to be breeding the same family when we breed two blooded animals. I would like to ask if the Devon in England is not considered a dairy cow?

Mr. Ballantyne.—Not that I am aware of. I do not pretend to know so particular about the Devon as I do about the Herefords, and I never have any recollection of hearing them considered as a dairy animal, and they are certainly not in England. The Shorthorns are considered the best breed as heavy milkers, and in districts where the milk has been considered, we find them very full milkers. In the neighbourhood of London they are almost exclusively pure Shorthorns. I would say exclusively, so far as my knowledge goes.

Mr. Curtis.—We have some Devons in the United States, and they are fine animals and good rich milkers—I would consider almost as rich as the Jerseys, and with more milk.

Mr. Ballantyne.—There are some Devon herds kept in this country, but I am not aware that those who keep them ever claim they are a Devon breed of cattle. I think Mr. Wade can answer that question better than I can.

Mr. Wade.—I have seen several throughout the country; they were not considered first-class dairy cows, but very good; and then there is the old idea we have of Devon shire cream, which, I think, could not have arisen unless they were good in the old country. I hear more of them as beef and for steers.

Adjourned at 5.3 p.m.

FIRST DAY—EVENING SESSION.

January 14th, 1885.

The Convention assembled at 7.30, the President in the chair.

He introduced Mr. Barrie, of Montreal, who, on coming to the platform, said that as this was his first appearance before the Western Dairymen's Association, he felt a little diffident; but he was much pleased for the invitation extended to him to address the Convention, and he was sure he would meet many friends or public-spirited men who for years have been working nobly and energetically and successfully to bring up to a high standard of excellence the most important branch of our agricultural industry. He then read his address on "What shall we do to Improve our Butter-making?"

WHAT SHOULD WE DO TO IMPROVE OUR BUTTER-MAKING?

By Mr. Barre, Montreal.

The necessity of improving our butter-making is universally admitted. The large quantity of poor butter made every year, the small average price obtained for it, the great falling off of our butter exports, and the considerable loss thus incurred, are subjects which have occupied public attention to a great extent during the last two or three years.

That the butter industry is in a most undesirable condition is an admitted fact. The question, therefore, naturally arises: What shall we do to improve our butter-making?

This question has already been largely discussed, a considerable number of valuable suggestions have been made, some of which have been put into practice. Still I believe that the question is not exhausted, and for this reason I have made it the subject of my address to-day.

In answering this question I intend to state:

1. What means have been taken to improve the butter industry in those countries which are celebrated as butter producers.
2. To compare those means with the ones we have so far adopted.

The most successful butter-making countries are Denmark, Germany, Sweden, France and the United States. Denmark stands first.

Amongst the causes which have produced the reputation of Denmark we find:

1. Thorough dairy education.
2. The following of methods calculated to produce butter suited to the requirements of the market in which they intend to sell.
3. The establishment of packing houses.
4. The making of arrangements by which butter is shipped as soon as it is made.
5. The establishment of large dairies; the establishment of creameries.

We shall examine each of these causes in succession.

FIRSTLY.

Denmark has provided for the education of dairymen in the following manner:

1. By the establishment of experimental dairy stations.
2. By the nomination of professors and experts.
3. By the nomination of consulting dairymen and teachers.
4. By the establishment of dairy schools.
5. By special dairy exhibitions and conventions.
6. By publishing dairy books and reports.

1st.—Experimental Dairy Stations.

In almost every dairy country of Europe we find several experimental dairy stations. In Denmark there are half a dozen, and eleven in Germany.

In these stations experiments of all kinds are made, new doctrines, methods, utensils and ideas are examined, approved and recommended, or condemned.

There is no doubt that these institutions have powerfully contributed to the successful development of dairying wherever they have been established.

When a Danish farmer wishes for information, he applies to experimenal dairy stations or to experts, and receives an answer which is always both practical and scientific.

2nd.—The Nomination of Experts and Professors.

In all countries where the importance of dairying is well understood, the governments keep a number of dairy experts of great ability constantly employed testing new methods as they appear, in comparing them with the old, and giving to the people at large the benefit of their experiments and of the knowledge thus acquired.

Thus in Denmark we find Fjord, Storck and Sabelien; in Germany, Soxhlet, Klenze and Faser; in Switzerland, Schatzman, etc.

A professor of dairying is also found in almost every agricultural college of any importance.

Thus we find Segelek in Denmark, Engstrom in Sweden, Fleishman in Germany, Chesnel in France, Chenon in Belgium, Sheldon in England, etc.

3rd. Nomination of Consulting Dairymen and Dairy Teachers.—In Denmark consulting dairy experts are employed. Their duties are: To study the wants of different localities and to advise dairymen in these localities, to attend dairy conventions, and discuss the general interest of the dairy industry. A number of dairy teachers are also employed to travel from farm to farm to give instruction where it is needed.

4th. Dairy Schools.—The first efforts made to develop dairying in Denmark date from 1836. In that year the Royal Agricultural Society first took steps to encourage young girls who wished to work at dairying. It procured for them places as apprentices in the best dairies and paid the expense of their education, so that they might be able to manage dairy servants. Young men were also furnished with means of getting a theoretical and practical instruction in dairy work in agricultural colleges and practical dairy schools. In the year 1874 a higher course of dairy teaching was founded at the Royal Agricultural College. This course which is given by Prof. Segelcke is purely scientific. Darying is also taught in the elementary agricultural schools. In these the teachings which is of a lower standard, is practical. During vacation a certain number of young girls are admitted for instruction in dairying. As a rule they are well to do farmers' daughters who do not care to undergo the hard work in the ordinary practical schools. They pay a fee of $9 a month for tuition and board. Sometimes as many as 75 or 80 girls are to be found in these institutions. The common schools are also used to spread knowledge of dairying. In these a theoretical and practical course is given. In addition to all this some 20 of the best dairy farms have been selected to places where those desiring it can obtain a thoroughly practical knowledge in dairying. A student is generally supposed to visit three or four of these dairy farms, remaining about three months in each. The student pays 60 cents a day to the proprietor of the farm if he remains less than a month, and fifty cents if he remains longer. He also pays 60 cents a week to the dairy foreman. He is lodged and boarded for this amount, but he is obliged to do all the work of the dairy. He is also obliged to provide himself with :

1. Account books	$3 50
2. A box of instruments	$8 00

The total expense to a student who remains two months in a dairy is as follows :—

60 days at 60 cts. a day	$36 00
8 weeks' tuition at 50 cents	4 00
Dairy books	3 50
Apparatus	8 00
Apron	60
Total	$52 10

In these dairies they turn out skilled workers, and excellent butter-makers. In fact all the large dairies of Denmark, keeping from 100 to 300 cows, and there are about 600 of these take in one or two apprentices. Thus it is safe to say that Denmark possesses at least 600 first-class institutions in which butter-making is theoretically and practically taught. These 600 institutions are spread over a territory equal in size to less than half of the Province of Ontario.

Dairy Schools in Germany, etc.—Since 1869 18 dairy schools have been established in Germany, besides a dairy institute for young girls only. Schools of the same kind were also successfully established in Sweden, Norway, Russia, Ireland, etc.

5th. Special Dairy Exhibitions and Conventions.—Special dairy exhibitions are held in Denmark once or twice a year. The following are the chief details of such exhibitions : The names of the competitors are unknown to the judges and to the public. The butter packages are designated in a catalogue by a certain number and by letters. In the registry entries, and also on a card attached to every package of butter, are found in an abridged manner indications as to how the cows were fed and how the butter was made. The following is an exact copy of such indications found in the report of the Holbæch exhibition, held in 1880. These indications are in themselves a condensed treatise on Danish butter-making in winter :

"No. 1880. A. B. 26 Cows.—Food, 3 lbs. ground oats and barley ; 1½ lb. bran, 1½ lb. rape cake. Hay once a day, milk set in ice 24 and 36 hours. Cream churned. Before churning 7 lbs. of new milk were added to the cream for every lb. of butter expected to be obtained. Cream set to acidulate 20 hours before churning at 7.20 Fahr.

with a mixture of $\frac{1}{3}$ of a lb. of sour cream per 100 lbs. of milk. Temperature of the cream allowed to fall to 63° Fahrt. $\frac{1}{10}$ of an ounce of colouring used per 100 lbs. of cream. Churning temperature 57° Fahrt, time of churning 45 minutes. Salt $\frac{3}{4}$ of an ounce per lb. of butter. Length of time between first and second working, 2 hours. Temperature of butter at the time of the second working 42° Fahrt."

This is evidently winter dairying. The indications vary *ad infinitum* according to the mode of feeding, to the system of skimming, and methods used. It is easy to see the practical utility of such proceedings. After the prizes have been distributed every one attending the exhibition can ascertain at a glance how the cows were fed, how the butter was made, which method and what class of dairies are the most successful. There are no first or second prizes given, but an award only is given without indication of rank. It is indeed very difficult to classify first-class butter, while it is easy to distinguish good from bad. A great number of prizes are given, and the prize winners are classified in alphabetical order. The butter-maker receives the prize and not the proprietor of the dairy. Exhibitions conducted in such a practical and instructive way have largely contributed to the improvement of dairying in Denmark.

The Publishing of Dairy Books and Reports.—Hand books of butter-making, reports of lectures, conventions and experimental work, are profusely distributed amongst dairymen and farmers. I have now given you, gentlemen, in a few words, an idea of the efforts made in other countries to spread a sound practical knowledge of dairying. It is evident from this that one of the great causes of the success of the Danes is to be found in the large number of trained assistants thus obtained.

The effect of an army of experts working at a given industry is to produce a great attention to details, and this attention to details could not but be attended with most valuable results. In order to oblige dairymen to attend closely to the details of butter-making, a special register is kept in all well-managed dairies. In this register are entered from day to day all items of interest concerning the milk, the cream, the quality and quantity of the butter, the improved or inferior results obtained from different methods, or from the same method employed at different seasons, in different circumstances, etc. By thus registering the operations uniformity is obtained, and, gentlemen, uniformity is a great thing. Prof. Segeleke says :—

> "The successful dairyman is he who can say,
> That he will do to-morrow what he has done to-day."

This uniformity in the operations produces uniformity in the product.

Secondly.

The Danes always make an article suited to the requirements of the market in which they intend to sell. To do this two kinds of butter are made. One kind goes to Brazil and other hot countries ; the other is shipped to England. The butter made for warm climates is a long-keeping article specially prepared for that purpose. The sort which goes to England is much more aromatic, but does not keep so long. Germany, France and the United States follow the same principle. The Germans make mostly for the British trade. The French make two kinds of butter, one to be consumed at once, and the other to be kept longer. Our American friends make principally to please the local trade, and generally they succeed admirably well. It is evident from this that the theory so often propounded, that good butter is good butter anywhere, is a false one. It would not do to ship to Brazil or the West Indies butter which would be considered good in Toronto, for the reason that it would be bad before reaching its destination.

Thirdly.

The Classification of Dairy Butter in Special Packing Houses.—In order to insure the perfect classification of the butter, special packing houses have been established in different parts of Denmark. To these the butter from the small private dairies is brought twice a week and classified according to its quality. With so much care and honesty is

this classification performed that the farmers willingly submit to the judgments of the skilled testers of the packing establishments. When the tester, through any fault in the butter, is obliged to mark it lower than second class, the packing house writes to the farmer, states the fault, makes a suggestion as to the probable cause, and tells him how to avoid it in future.

FOURTHLY.

Arrangements for Facilitating Immediate Shipment.—Normandy butter is shipped to England twice a week. German butter arrives in the English market a week after it is made. Until recently it took three weeks to bring Danish butter to the English consumer, but now it requires only from ten to fifteen days. Twice a week butter cars are placed on Danish railways, leading to packing houses, large cities and seaports. Thus semi-weekly shipments are made in the best of conditions.

FIFTHLY.

The Establishment of Large Dairies; the Establishment of Creameries.—One would think, gentlemen, that after the many and persistent efforts made to spread a thorough knowledge of dairying, in a small country like Denmark,—after the lavish expenditure of money made for this purpose by the Danish Government, an expenditure which, last year, amounted to, I believe, $50,000—I repeat, one would think that it would be almost impossible to find a person engaged in agricultural pursuits who was not fully competent to make first-class butter. Still what is the truth; it is useless to hide it. On four-fifths of the small dairies the butter produced is very far from being what it should be. The proof of this is that it sells for five, eight and sometimes twelve cents per pound less than that made in large dairies. If after thirty or forty years of intelligent and energetic work, if after using all the resources of its admirable system of dairy teaching, if after employing the numerous agencies which we have described, such a small country as Denmark has to a great extent failed to improve butter-making in its small dairy farms, allow me to ask you how many hundred years will it take to reform butter-making in a country like Canada, where, comparatively speaking, so little is done to improve it, and where it is mostly all made in small private dairies? No longer back than two or three years ago the very question I am treating now, that is: What shall we do to improve our butter-making on our small dairy farms, was discussed in the Danish press and in meetings of this kind held in Denmark. At that time it was said that the time of apprenticeship served in the schools and in the dairies was far too short, and in consequence the education of a great number of dairymen and dairymaids was far from being up to the requirements of the times. The butter dealers complained loudly that the butter from small dairies lacked in uniformity, keeping quality, etc. One of the means suggested to remedy these defects was the superseding of the small dairies by creameries. It seems that this suggestion was acted on to a great extent, for we read in the report of the consulting expert, Jessen, published in 1884, that a considerable number of co-operative dairies (creameries) were established in 1883. Being desirous of obtaining reliable information on this subject, on the 30th of April, 1884, I wrote to the editor of the *Ugeskrift for Landmeand*, a journal devoted to the dairy interest, published in Copenhagen, and on the 15th of June I received an answer of which the following is the substance:—

He was unable to state exactly the number of creameries in Denmark, Sweden and Germany. They were, however, steadily gaining ground. Some had failed, but the greatest number had succeeded and were holding their own. In answer to the question, what he thought of the establishment of co-operative dairies, he stated that in localities where butter-making was not properly understood, nor practised, it was more profitable for the farmer to abandon the manufacture of butter, and leave it to the creamery. On the contrary, if the farmer was competent to make good butter, it was more profitable to make it himself.

It is well to remark that our conditions and those of Denmark are not identical; in Denmark farm help is plentiful and cheap, here it is the reverse. It is, therefore, evident that in the case of small dairies it would always be more profitable for a Canadian farmer

to leave butter-making to the creamery. From what I have just said, gentlemen, it is evident that the reputation of Danish butter has been built up principally by the large private dairies, and that any attempt to educate the whole agricultural population of a country up to a high standard of excellence in butter-making can only be attended with failure. In Denmark there are about 600 large dairies, keeping from 100 to 300 cows. These, it is evident, make butter a business, and therefore make it good. There are 4,000 dairies, keeping from twenty to sixty-six cows. It is evident that to these also the making of butter is of primary importance. Seventy thousand others, of which 30,000 keep less than seven cows. The butter made by these, as a rule, does not rank high. One-third of the quantity of butter made in Denmark comes from the large dairies. It is this one-third which has made the reputation of Danish butter. Germany follows Denmark's example, and goes in for the establishment of large dairies, either private or co-operative. There are in the different Provinces of Germany (excepting Bavaria) ninety-two dairies conducted on the co-operative plan, disposing of the milk of from fifty to 2,000 cows. From two to 160 patrons send milk to these ninety-two co-operative dairies. The milk is brought from a distance of from four to twelve miles. The system of skimming used in these creameries was in 1881 classified as follows :—

Shallow setting	18 to 19%
Centrifugal	33 to 36%
Ice and cold water	41 to 45%

In the Province of Bavaria alone there are at least 900 co-operative dairies, working about 1,000 pounds of milk per day. These co-operative dairies are also to be found in Sweden, England, Scotland, etc. Let us now see how what has been done elsewhere compares with what we have done to improve our butter-making.

1st. Instead of using experimental dairy stations to test the value of methods, theories, utensils and dairy machinery, our dairy farmers have for years been left struggling with tin cans, pans, churns, and any amount of conflicting theory. We have asked them to test the value of all these different things, just as if they all were in a position to do the work properly.

2nd. Our staff of dairy teachers is very small.

3rd. Every man follows his own system of butter-making. Perhaps there are not five farmers in a hundred who know exactly how much milk they get from their cows, how much butter they make in a season, and still less do they know how many pounds of milk it took them to make a pound of butter.

4th. The best methods for raising cream for the average dairy of this country is deep setting in ice. What do we do? With very few exceptions, we still cling to deep setting in ordinary well or spring water. In summer this is very defective. When we do not use this plan, we use shallow pans at any temperature.

5th. Instead of having the butter handled in packing houses by experts, the ordinary country store-keeper buys it in different quantities, of different shades of colour, and of different qualities, he dumps it good and bad, white and yellow, into tubs, keeps it in a cellar with coal oil and other sweet-scenting substances, after which he sends it to large cities, where it is frequently used for axle grease. We would have no objection to this, if the store-keeper paid a good price for the good and an inferior price for the bad, but he does not. He generally pays a uniform price for all. No farmer can be expected to take the trouble of making good butter when the price given for bad butter is just about the same as for good.

6th. Instead of promoting the establishment of co-operative dairies, we advise our farmers not to go into co-operative dairying, and this in spite of the fact that on account of the scarcity of help, a farmer is often incapable of making even good butter.

To improve our butter-making we would propose :

1st. The establishment of experimental dairy stations.

2nd. The nomination of experts and dairy teachers, if the proper men are to be found.

3rd. The establishment of dairy schools.

4th. The rendering of our dairy exhibitions more instructive and practical.

5th. The publishing by the Government of a yearly report of the state of the dairy industry.

6th. The use of deep setting in ice in small dairies; the use of the centrifugal in large dairies.

7th. The employing of methods which will produce good keeping butter.

8th. That good makers should take out a trade mark.

9th. That arrangements be made to ship butter from the dairies in a fresh state.

10th. Last, but not least, we say establish creameries, and run them according to the most improved systems, wherever it is possible.

Now, gentlemen, before concluding we shall say a word about the establishment of creameries. Amongst the objections to their establishment we find :—

1st. It is necessary to draw the milk twice a day. The centrifugal separator, which has been in operation over three years in this country, does away completely with this difficulty.

2nd. Milk is paid by weight, the same amount is paid for rich and poor milk, which is unfair. This objection is not a serious one, except in cases which are pretty rare, of special herds; but even so, by the use of Prof. Fjord's new milk controller, this difficulty will soon be obviated. Before long the patrons will be paid in proportion to the richness of the milk, and not in proportion to its weight.

3rd. The best butter is made in the private dairies, because the feeding and the milk is more under the control of the operator. It is true that the best fancy butter for immediate consumption is made in some of the private dairies. It must not be forgotten that it is also true that all the bad butter comes from private dairies, while it is certain that the creameries produce good butter. If by accident a creamery should produce bad butter it would not make it very long; it would soon be obliged to close.

4th. Another objection is, that after many years of co-operative dairying the much largest proportion of butter comes from the private dairies. This simply means that co-operative dairying is not a child of rapid growth. It is true, gentlemen, but like all healthy children, it is a child of steady growth. The establishment of creameries will produce the following results :—

1st. It will increase the herds, and thereby improve agriculture.

2nd. It will reduce the waste of capital and labour.

3rd. Produce uniformity in the make, good packing, by doing away with store packing, and early shipments to distant markets.

4th. It will serve as practical school of butter-making to the surrounding country, and by this means will do much to improve the make even of the private dairies.

Mr. Barre's address was received with marked attention, and he said he had another paper he would be happy to read at their earliest convenience. This information was greeted with cheers.

Discussion on Mr. Barre's Paper.

Prof. Mills.—What object would be gained by the establishment of dairy experimental stations?

Mr. Barre.—To prove what has already been proved. It would certainly be repeating the experiments that have been made in Denmark and other places. But there are a hundred questions connected with the cheese and butter making, and there are many questions to be solved yet, and these can only be solved in a station of that kind.

Mr. Moyer (of Walkerton).—I understand the speaker to say that the introduction of creameries would remedy the trouble we drifted into in getting the bad reputation for our butter. What system would he propose; would the system in Denmark remedy this?

Mr. Barre.—There are two systems of creameries which could be used to advantage, I believe, in this country; but they need to be improved, both of them. I think the gathering cream system could be much improved, and I would not advise to erect a creamery where the milk was to be brought, except the centrifugal system was used. I believe this will bring the quickest change in butter-making.

Mr. MOYER.—Can that change be brought about by the educational institutions spoken of?

Mr. BARRE.—We must get practical butter-makers to be at the head of these institutions. Of course, it is slow work; but, with a little energy, we can accomplish it. In our Province we have established in two years five creameries by the Centrifugal system, and they are all doing well.

Mr. MOYER.—Within what radius do you collect the milk?

Mr. BARRE.—About four or five miles.

Mr. MILLS.—Do the farmers bring it themselves?

Mr. BARRE.—Not as a rule; generally they club together, and each brings it a term.

Mr. MILLS.—And take back the buttermilk?

Mr. BARRE.—Yes, sir. The question between the centrifugal and the cream-gathering system is to know whether the amount of butter obtained through the centrifugal would not pay the transportation of the milk. I am pretty sure, as a rule, it would produce a better quality of butter, and more in quantity.

Mr. BALLANTYNE.—Is the greatest quantity of butter made in Denmark made on the centrifugal system?

Mr. BARRE.—To-day, the largest quantity of butter made in the large dairies is made by the centrifugal, and is mostly shipped to England; the butter to be shipped to Brazil and hot countries is still made by the deep setting process in ice.

Mr. MOYER.—I understood Mr. Barre to say that in Denmark with their very high system of education, yet four-fifths of the butter is still of an inferior quality.

Mr. BARRE.—Four-fifths of the butter produced in the small dairies.

Mr. MOYER.—Well, then, the educational system would not reach any small dairies?

Mr. BARRE.—Not as a rule.

Mr. BALLANTYNE.—Is the highest quality of butter made by this system?

Mr. BARRE.—To-day, as good butter as is made in Denmark is made by the centrifugal system.

Mr. MOYER.—Can as good butter be made by this system as by any other?

Mr. BARRE.—Yes, sir; if you know how to make it.

Mr. BALLANTYNE.—Do you think the centrifugal system is suitable for the average farmer?

Mr. BARRE.—No; in Denmark, they use it in dairies of from twelve to fifteen cows; but, of course, their herds, as a rule, are more improved and in better condition than ours. I would not recommend the use of the centrifugal system in a dairy of less than twenty or twenty-five cows in this country.

A MEMBER.—Have not you a different climate from that in Ontario?

Mr. BARRE.—Yes, but it makes no difference with this system. We use no temperature heat or cold.

Mr. MOYER.—We have the facilities, I believe, in this country to make as good butter as any other country in the world, but what we want is to do away with our bad butter, or convert our milk into a better class of butter, all over the country. The system to do that the quickest, and most practical, and, at the same time, to be suitable to our farmers, is what we want.

Mr. BARRE.—No system, I am fully convinced, from what I know of these things being done in other countries, has yet been discovered by which we can hope to reform quickly our butter-making, except by going into co-operative butter-making.

Mr. MILLS.—I would like to know whether we have any reliable market for butter, but the English market (and whether we should go into it somewhat extensively); and

whether, if that be the only reliable market, if butter be produced in any considerable quantities, can we make and ship it to England at as great advantage as we can cheese? (Hear, hear.) That is a question that has come up among the farmers, and I am not prepared to answer it. We ought to have men here who are capable of answering this question. How much a pound would it cost?

Mr. MOYER.—I think we can make as much out of butter as we can of cheese.

Mr. BALLANTYNE.—I am not prepared altogether to agree with Mr. Moyer. It has been an experiment so far with those who have tested and tried it. Butter factories or creameries, so far as they have been tested in this section of the country, have not been very successful. Cheese factories, on the whole, have been a great success. Before going into the question of which pays better—butter or cheese—I would say that there are some sections in which cheese would never be made, but where they are continuing to make butter in private dairies, and we can only hope for an improvement by the creamery process. I am not quite clear, in point of profit, as to the cream gathering system, but I do not believe they could be induced to go into the creamery process, while the farmers wanted to make butter and raise calves for the purpose of producing beef for the English markets, and can get a comparatively high price for their animals. By the cream-gathering process, I think, in time, they might be able to get along all right and produce butter of uniform quality, doubtless as fine as can be made by setting in ice. In cream-gathering districts I find it takes about 7 cents per lb. to pay for gathering the cream and manufacturing the butter. That is the result of my own section; if 22 cents was taken as an average price for butter, and take 7 cents from that, the result showed the price obtained. In referring to the annual report of a factory in this neighbourhood I find the average price of cheese is 11¼ cents for the whole season. The milk that will make 1 lb. of butter would make 2½ lbs. of cheese, and you can judge by these figures which is the most profitable. There are sections where they will continue to raise stock, and I think that everything possible should be done with a view of establishing the cream-gathering process, in order to raise the quality of our butter. I do not think the centrifugal system at all adapted to our small dairies. In that case the whole of the milk has to be taken from the farm, and then came the expense of hauling it. There was no difficulty in gathering the cream from a great distance; and in this way the milk was left with the farmer, and in the best possible condition. I think this system best adapted to this country.

Mr. MOYER.—I have had considerable experience in the cream-gathering system, and I find that the expenses connected with the bringing of the cream to the factory is not near 7 cents.

Mr. RICHARDSON.—I think Mr. Ballantyne said doing the whole work.

Mr. BALLANTYNE.—It was the result of personal inquiry, and also the testimony of the secretary of the Iowa Dairymen's Association.

Mr. MOYER.—We must be able to introduce it on a basis that will pay us as well as cheese, or we must quit. Although we are not able to do it now, I think we have shown very favourably in comparison with the cheese. Our creameries are in operation where farmers keep only five or six cows, and where they do not keep more than that they cannot and have not made anything like 9 cents a gallon for their milk, so that we must compare our creameries as to your cheese under the same circumstances. If we can net 22 cents for butter we are in a position to give the farmers about 18 cents per pound for their butter. I think four cents will pay all expenses for gathering and making and everything connected with it. I have experimented in different ways at considerable expense and cost, and also sent a young man to England to get acquainted with the business there, and I find that the prejudice they have against Canadian butter is not a very serious one, but still it takes considerable time to get over a prejudice of that kind. There is butter that sells much higher than the creamery butter, simply because of the prejudice against our Canadian butter, and when we get over that I think we can get a good price for our butter there. Those other speakers have been preparing their say upon paper, and I am somewhat embarrassed, coming up here without having first prepared

myself for this discussion. I have been very much interested, though, in those papers, and learned a good deal, especially from the last paper, as it was in my line of business. I was also much interested in the papers read this afternoon in reference to breeding cattle. That is a question that should be better understood by our farmers. I find that the great difficulty in running the creamery is that the farmers have studied their part of the business so little that they do not understand or have not learned how to breed their cows, nor how to feed them to the best advantage. The great difficulty we have in our case comes from allowing the farmers to skim their own milk. There are some dishonest ones amongst them who do not do it properly, and we lose something that way in the creamery system. However, I think we have a system now that will overcome that objection. It is necessary to allow them to do the skimming themselves, because they want the milk for their calves, and want it in the best condition, both night and morning, and if we skim it ourselves they cannot get it unless it was gathered twice a day. We, as manufacturers, do not run the risk of the cream being adulterated with milk; we make the farmers shoulder that part of the business. They think they can realize almost as much for the cream alone as for the whole milk. They are paid according to the yield of the cream. They are divided up into what we call companies, say about 25 farmers in a company, and they are paid by the average of the cream in that company. With some companies the milk comes in wrong, while with others it comes out right. They know how their cream is averaging all the time, as we let them know about every three days what they are getting for their milk. This way creates a rivalry between them. Where we find a dishonest person, or where the gatherer suspects anything is wrong with the milk, he simply puts the milk in the can when he goes around and locks it up, and afterwards a man goes out from the factory and churns the milk on the place. In this way the gatherer escapes the blame of having spilled any of the milk taking it to the factory, and when a man is found out in a test like this and causes such a trouble he has to pay the cost of the test. In this way the farmers run a risk, and they will do but very little in the way of adulterating the milk. I believe the farmers will soon find out that it is not only right, but policy on their part to do the right thing; and that system, I think, will do away with all the trouble, and we who are running the factory have no risk to run at all, because it is their part of the business to look after giving us good cream, and if there is any cheating done they cheat their neighbors, not us. So you see, in this manner, they are all kept watching each other. The young man I sent out to England was there all the summer, and he said that Canadian butter was equally as good as the best butter brought into the English market, but they had a prejudice against it. They tasted it, but still they won't buy it, as they are afraid it will go wrong. They are very conservative. We have facilities now that we can give them good butter, and just as soon as we can show them we can give them as good butter as they can get anywhere else we will get good prices, and we can certainly make as much out of our creameries as can be made out of cheese. It takes 10 lbs. of milk to make a pound of cheese, and 25lbs of milk to make a pound of butter. Well, if the farmer gets 15 cents for butter he gets 6 cents a gallon for the milk, and has the skimmed milk at home in addition, which is worth at least 2 cents a gallon. At a meeting I called at the close of my season I asked the farmers, and they decided at that meeting that the skim milk left in the shape we did is worth 3 cents a gallon. Now, if that is right, we have 9 cents, even if we allow them 15 cents for the butter. I have paid them as much as 19½ cents for a season; never less than 17½ a season, but with this you must remember we are labouring under a bad reputation. Our Canadian cheese stands to-day at the head of the market, and our Canadian butter stands at the other end. We can show up very favourably with the cheese, so that we do not need to look upon the creamery business as though we had to go into it because we have to, but because we can make it pay. It is true that our creameries, so far, have not been a very great success, but it is simply because they have had no show. It has been a good many years since the cheese business has been introduced, and it has risen during those years to the position it now occupies. Let us have that time for the butter, we only want a few years more; two or three more, I think, will do the whole work, and Canadian butter will go for what it is worth. I think we can get over the prejudice in a few years. I think, as the other speaker said, the only remedy is to adopt the creamery system. The

whole business is wrong from one end to the other. The way it is brought through the stores is wrong, but it is of no use to say that they are the only ones doing the wrong. There are, perhaps, some storekeepers here. I have bought butter over the counter for years. The storekeepers cannot change the fact that there is bad butter made. Butter makers have all of them so many different tastes. Some of our women have such a peculiar taste that they say they always make the best butter. I have had, perhaps, as much experience in the butter line as any man in Canada. I have visited a great many farmers for the special purpose of trying to get them to make butter, and have found some that make abominable stuff, but they said the storekeeper told them that they were making the very best butter almost in the country. We will not remedy the great loss of about five million dollars to this country every year, unless we adopt the creamery system, and the question if there is any other system we know of that is so well suited to our country, provided we can get it to work harmoniously; it was new to me and I had to learn by experience. By the system we are now adopting we will get over the trouble and be in a position to show the country that butter-making is paying as well as cheese. This man has been in England, made arrangements with a respectable firm and one of them will come out here in the spring to take our butter. We are running five factories, and want to be able to give them a car load at a time to put on the market every two weeks, and I think, in this way, we will get over the objection they have to our butter, and, unless cheese makes more headway, we will soon have a margin ahead of it.

Mr. Mills.—Have you shipped any butter to England this year, and what did it average you?

Mr. Moyer.—About 22½ cents, but we were labouring under very great disadvantages this last summer owing to the fact that we had a very dry season up where we were through Bruce and Grey. We had very little rain. We had to close down two factories in September. No rain in Elderslie after the 24th May. A farmer up there told me he put all the milk from six cows in one pail and did not fill it. On this account our average was not so high as it would have been. The farmers up there knew nothing of soiling.

I have been trying to get them into it and tried to get them to sow corn so as to afford them some pasture in case of a drought, but it takes them a long time to get into it, and our country has got to grow into it. I believe the only way is to get the best of them to go into it as a start.

Some creameries have failed, but I believe they were run on the Elgin system. I was one of the unfortunates that started on that plan. I saw what the country was losing by the bad butter. Scarcely a package of butter left our market fit for the table, and, certainly we should not send it away to a foreign market and expect them to eat such stuff. So I went into the creamery system, and, at that time I did not know anything about it, and, of course only experimented with it. The first year I lost a great deal of money, for I undertook to pay as much for milk as they did in the cheese factory. I proved this, however, that I could get a better price for my creamery butter than could be got for store butter. I sold both kinds to the same man and got ten cents a pound more for the creamery butter. We can manufacture the creamery butter cheaper in the factory than they can all over the country. The labour connected with the creamery is not more than that connected with the cheese. This may seem almost impossible, but such is the case, and my patrons will bear me out in this. The setting of the milk is only a little more than putting the milk in the can to go to the factory. Another great thing is, they can milk their cows when they like. In taking the milk to the factory sometimes the routes are so long that the team has to start sometimes at four o'clock in the morning at the beginning of the route. A great thing in favour of the creamery or cream gathering process is, the farmers have all the milk left at home where they require it, and it has a good deal to do with the fertility of the soil. Our climate is adapted to carry on the creamery the whole year round. We cannot make cheese the whole year round. Where farmers are now keeping 5 or 6 cows they would keep 20, 30 or 40 cows. I think this feature of the creamery system is a long way ahead of the cheese business. I do not want to hurt the cheese business. Certain parts of our country are, perhaps, better adapted for cheese-

making than butter. Thus far we have made the best out of the cheese, but certainly not out of our butter; and it is only right and the duty of some of us who are willing to sacrifice, to work this butter business and get it on a level with the cheese business. Our butter business has been sadly neglected. We have made rapid progress in almost everything in our country with the exception of butter. We are certainly ashamed to show our butter, and there is no reason for it. We have every facility—good water and pasture, and everything in this country to make as good butter as any country. This man I sent out to England says that our butter put alongside of the Danish butter is the best of the two and would sell for more only they have the prejudice against it. Just as soon as we get the English people to understand that we can ship it good at any time of the year they will give us good prices, and I believe we have good prospects of making this thing work.

Mr. BARRE.—I believe that the market for butter is just as important as that for cheese; but, unless we take some very effective means of shipping, it fresh, it is impossible to compete against the European countries. Still, I believe, the cheese will always lead in facilities for shipping, and, as the cheese market is very important and increasing, I would not advocate creameries against cheese factories. We only want to establish the equilibrium in the production. A very large portion of our production of butter is bad, and I believe we ought to take steps to improve that—as far as creameries are concerned. I do not believe that they had a fair chance yet. It took years of intelligent work and study to bring up the cheese industry to the high standard of excellence in which it is now standing; and, I must say, ladies and gentlemen, that we must give credit to the cheese-makers of Ontario for a great part of this work. But, with all the defective machinery and means employed, I do not believe the creamery system has had a fair chance; and, for this reason, I am in favour of a study of the best means and methods and best system of creameries, whether it be the centrifugal or cream-gathering system. I am very glad to hear that so much improvement has been made in the cream-gathering system; still, if we must believe the result of experimental work made in Denmark by the best scientists and experts—experiments which lasted twelve months, the centrifugal system gave from 15 to 20 per cent. more butter than all the systems of setting known, and it will give, I believe, 25 per cent. more butter than the deep setting, as it is generally used in this country. For this reason, I believe that we ought to look deeply into it, not to condemn it before we know about it. I should, therefore, be in favour of a study of these different systems. We should try to improve them as much as we can, and use them in sections where they would be most advantageous. There are certainly sections in this and other Provinces where the cream-gathering system would succeed the best, but I am sure there are, also, many sections in which the centrifugal would succeed best; therefore I would be in favour of such study before, so as to give a fair chance to the system, and have it practically and thoroughly tested, and then adopt the systems which would be most advantageous to the different sections.

The Association then elected the following Nominating Committee:—Messrs. Wheaton, Thompson, Cook, Ballantyne, and Dickson.

Discussion was again resumed:—

Mr. CURTIS.—It seems to me that this subject has been pretty well aired, but it has occurred to me that there is such a thing as a home market for your butter. Is it necessary that Canadians should forever be making dairy goods to carry out of the country, and thus take away the finest portion of the soil with their butter and cheese. Must they always do this? Is it not possible for you to develop your manufacturing industries and your other industries that the one will balance the other, and thus create a home market for all your dairy products? I only throw this out as a hint. I do not propose to discuss it; we, on the other side of the line, have home market practically for our butter, and we make somewhere about a billion pounds, as near as I can get at it, and we use it nearly all up. We have no need for a foreign market. We made the mistake of making a cheese for export; that discouraged home consumption, and the result is that for the largest part of our cheese we have to depend on the foreign market. In sending your butter abroad, can you afford to make butter for 20 and 22 cents a pound? Now, that is all we can get in New York for butter for export, I understand. Can you sell it

at a profit for that price? If you can, probably the export trade is a good thing for you. We find it does not pay to make butter to export for 20 and 22 cents. There is a great deal in this dairy business, and there has been a good deal said about system; but I am not able yet to hit upon anything that I would really like to call a system of butter-making. We have different ways of handling the milk and cream, but when it comes right down to a scientific system, where is it? Is there any dairyman present who can go deliberately to work and duplicate his results day after day? I have never found one. I have heard of a man who could duplicate making butter, but he has not yet done it. It is a very difficult thing to produce duplicate results day after day either in butter or cheese manufacture. It is a hard thing to do. There are so many things that are unsettled. The different modes of setting, it seems to me, might be divided into four. We have the deep setting and the shallow setting; we have the slow cooling and the rapid cooling; and those are the only divisions I am able to make. Experiments made in different sections, notably those by Prof. Kedzie, of Lansing, Michigan, seem to indicate that not a low temperature but a moderately low temperature produced the very best results. I think he said he carried on a long series of experiments and at different temperatures and by different methods of setting, and he got the best results by setting at a temperature of from 50 to 60 degrees. And this, it seems to me, if properly carried out would produce better results than any of the others, especially running the temperature down very low, and yet I know some who get a good product by cooling excessively low, but to me it lacks some in flavour. Cooling excessively low will produce a sour flavour, and yet a great many people like that kind of butter. Now with this cream-gathering system, as I understand it, I have seen and questioned a creamery man of Iowa, notably Mayor Sampson, who owns the Storm Lake Factory, and he says it is very difficult in hot weather to get their milk in a condition to make good butter, and yet we know this creamery butter has had a high boom. The cream, he says, comes to him not only very sour, but often utterly melted down, and it is utterly impossible to make a good product out of such. Perhaps you in Canada can avoid it, but they cannot there. Hence I have not looked upon the cream-gathering system as anything feasible except where they cannot get milk without carrying it too far. In Iowa they carry it forty miles, or even sixty. They will drive out ten or fifteen miles and gather it, and in this way get over a large amount of country. This is on account of the scarcity of dairies. I believe the time is coming when the private dairy is going to make the best butter, when all dairying will be carried on mainly by private dairymen owning large establishments and a large number of cows, and that they will turn out a fine product. As it is, you get your milk from Tom, Dick and Harry, and it is utterly impossible that you should get your cream in the best condition. I do know large private dairymen who control all the conditions, but they select their own stock, attend to the feeding and the milking, and have all the handling right under their directions, who make thus fifty, seventy-five and one hundred pounds of butter. They have special markets for it, and from this it seems to me that the tendency is towards private dairying on a large scale in sections suitable to it. There is a cream gathering society in my State, located in Waterville, which works up the milk of about a thousand cows. There every farmer skims and sets his own milk, and, as I understand it, they practice what we call deep setting. Every farmer skims his own milk and puts the cream into a can, and once or twice a week a man drives around and takes these cans to the factory. Every man's cream is churned separately. They have the churns on a long shaft, and they are run by a belt from a shaft. If the butter is all right it goes in with the quality from the factory, and it receives the factory brand. If it is inferior it is set by itself, salted and packed down. All is weighed, and they get their pay according to weight. The patron has the choice of allowing this to be salted, or paying, I think 2½ cents, for the making of it and packing away, or he can take it away and do what he pleases with it. A man and his wife have done the work for four or five years for this thousand cows, so you can see it is not so terribly expensive. I think if you carry on the cream-gathering system in Canada you will have to resort to that system.

Mr. Mills.—What do your dairymen get on an average for their butter?

Mr. CURTIS.—Twenty-five to thirty cents, and even forty, but not this summer; thirty and twenty-five have been the cheapest.

Mr. MOYER.—In churning it by itself, it is not supposed that each person's will fill a churn.

Mr. CURTIS.—They have different sized churns. When I visited the factory their butter looked all uniform. They have a system of colouring.

Mr. MOYER.—I understood you to say it was not possible to make a duplicate result.

Mr. CURTIS.—It is not.

Mr. MOYER.—That would certainly seem to me against that system, and you would then not be able to fill the packages with the same kind of butter.

Mr. CURTIS.—I have asked those questions myself. Many of their churns will fill a package itself, and I always found it uniform when I bought it for my own use, and they say they have no complaint in the market

A MEMBER.—Was that creamery a success?

Mr. CURTIS.—It has been running five or six years, and is running now.

Mr. MILLS.—Did one man and his wife do all the work, making from a thousand cows?

Mr. CURTIS.—Yes, sir.

Mr. MOYER.—Do they collect it once a week?

Mr. CURTIS.—In hot weather every other day. I know just exactly how it strikes you, just as it did me.

Mr. MOYER.—We must get to the nearest thing practical in our country, so as to apply it to all parties concerned, and if we encourage private dairying some will go into it, but still a great deal of butter will be made and sold at a great loss. I always thought the Americans were very much for their country and not so much for their individual profit, and I have been preaching to our farmers that they ought to be more like the Americans. I want them to look at the country as a whole, and try and bring an improvement in this matter for the sake of the country without doing any injury to themselves.

Mr. CURTIS.—I think the co-operative dairying on almost any plan needs improvement.

Mr. CHADWICK.—Years ago the Mecca of dairying was Utica, and everybody made an annual pilgrimage to that city. At these gatherings they not only talked over dairying matters but others also, and they found this coming together had a beneficial effect. They begun to think that by doing business in a business way, instead of staying at home and allowing others to go and carry away what they made was what paid best. At the same time there is a vast amount of injustice in associated dairying. The difference in the quality of milk is very great, and we have no system yet by which equity is reached, that I am aware of.

Mr. CURTIS.—The inch plan was tried and the cream measure, as well as the shock and bolander test, but now they are working on the centrifugal machine, and it is doing good work out in the West.

A MEMBER.—What form of a churn do they use in that factory at Waterville?

Mr. CURTIS.—Simply the box churn.

Mr. MOYER.—What machine do they test the cream with?

Mr. CURTIS.—They have a vibrating machine or oscillating rack, if you like to call it, run by machinery or turned by hand. They put a specified amount of cream in a jar and put the jar into this machine, and oscillate it until it churns the cream. They then take it out and work out the buttermilk and work the butter. Credit is given just as it turns out. When the dividends are made, each is paid according to the test.

Mr. MOYER.—Is there not this difficulty with that way, that cream churned in a different temperature will weigh more when it comes out of the jar than in other temperatures?

Mr. CURTIS.—It is all churned right at the same temperature, and these samples are carefully saved so as to be averaged.

Mr. MOYER.—Will the patrons not get the makers into trouble as they did me?

Mr. CURTIS.—The patrons have the privilege of coming right to the factory and seeing the test, and they can have a test made as often as they like.

Prof. MILLS.—Suppose you have two cows differently fed, but they are milked under the same conditions, would a cubic inch from one cow produce as much butter as a cubic inch from the other?

Mr. CURTIS.—It has been proved by actual experience that it will not. That is what makes the necessity for testing. I understand that cornmeal makes a very solid cream and will give a very large yield of butter, but feed her bran and it will make it frothy and it will not produce as much butter. There are innumerable things, almost, that makes testing necessary.

Mr. MOYER.—My experience has been not so much in the quality of the cream, providing the skimming was done right, and the cream raised in the same way and under the same temperature.

Mr. CURTIS.—The Fairlamb system assumed that 113 cubic inches of cream should make a pound of butter. At a factory at Liberty, a test was made and they found that in many cases they only got eight, ten, and twelve ounces all set in the same way.

Prof. ARNOLD.—There is, according to the most accurate source made, no reliable test for the quantity of butter to a given amount of cream or milk, short of the churn. You cannot get at it by chemical analysis either. You can take two quantities of milk that will analyze exactly the same of butter, and one will give more than the other in the churn. Cows of different breeds make a wide difference in the quality of the cream. Take a cow that gives very large globules and when they rise to the surface they will double up like bullets with open spaces before them; then if you have small globules they pack together pretty close. Now suppose a sample of milk had some large and some small globules in it the little ones will get in between the large ones and fill up and make it solid, so that that cream will give you a large yield of butter. Scientists have come to the conclusion that the churn is the only reliable test; still there is a sort of approximation which, after all, is a pretty practical test, but when exactness is wanted resort must be had to the churn under the same circumstances. It is about as difficult to churn two samples out of the same mess of cream and get them alike as it is to get two samples alike under other conditions.

Mr. MOYER.—I would endorse what has been said by Prof. Arnold.

Prof. ARNOLD.—We must not stop the cream system because we cannot get the same all the time. That would stop all enterprise in our country. We have injustice in all kinds of business, and I think we should not say too much against it.

Mr. BARRE.—I fully agree with Prof. Arnold's remarks.

The Convention then adjourned at 9.45 p.m.

SECOND DAY—MORNING SESSION.

THURSDAY, JANUARY 15th, 1885.

The President took the chair at 10 a.m.

The Committee on Order of Business for the day presented the following programme of procedure:—

Morning Session.—Mr. T. D. Curtis, Syracuse, "Cheese-making in the West;" Mr. Robert McAdam, Rome, N. Y., "Cheese making."

Afternoon Session.—Election of Officers; Prof. Arnold, Rochester, "Dairy Products as a food;" Mr. J. B. Harris, Antwerp, N. Y., "Dairying in Scotland."

Question Drawer.

Evening Session.—Mr. B. Gilbert, Utica, N. Y., "The dairy business in New York and Canada;" Mr. A. Blue, of the Provincial Bureau of Statistics.

Question Drawer.

Friday, January 16th.—Morning Session; Prof. Brown, Guelph, "Ensilage in the Dairy."

Discussion and Question Drawer.

The President then called upon Mr. T. D. Curtis, of Syracuse, N. Y., to read his address on "some hints on dairying."

SOME HINTS ON DAIRYING.

(BY T. D. CURTIS, SYRACUSE, N. Y.)

The older I grow the more I am convinced that the highest success in any line of dairying depends upon having all the conditions right. But there seems to be a sort of popular notion that an expert is, or ought to be, able to force success, in spite of all conditions.

At the milk conference held in Gloucester, England, last May, Mr. John Oliver said: Many dairymen imagine that cheese of all sorts can be made in one place, amidst all sorts of surroundings; but this is impossible, if success is to be attained.

I agree with Mr. Oliver, not only as to "cheese of all sorts," but as to making any kind of dairy product "amidst all sorts of surroundings." There can be no successful dairying where the conditions are not right. There may be partial or even tolerable success where some of the conditions are unfavourable, but complete success never, unless all the conditions are right. More failures are attributable to bad conditions than to errors in manipulation. Indeed, the best skill in the world cannot overcome the unfavourable effects of bad conditions.

The scientist, or the man given to exact experimentation, very well knows how important it is to have all the surroundings and every condition right. They must not only be right, but identical, or he cannot obtain duplicate results. Even a variation of right conditions will have its effect on the result. If this were not so, there would be no need of science. In short, science consists in knowing how to maintain conditions as you want them, and to thus secure the results aimed at. In this consists all the difference between scientific and unscientific methods. Science is uniform and exact and based on positive knowledge; unscience is irregular and haphazard and is based on lack of positive knowledge. A man does not need to be scientific to see this. It is self-evident, and is confirmed by every-day experience. It is true in the dairy, and in every department of human industry. Yet, many seem to suppose that they can succeed without knowledge and without regard to conditions. They somehow seem to think they will stumble through successfully by sheer "luck," and hence we hear more said about "good luck" than we do about the precise methods of doing things. "Luck," and not science, is the industrial god that

receives the adoration of a great majority of mankind—and often to their sorrow. With these general remarks, I propose to consider a few points and give "some hints on dairying," in accordance with the title of my paper. As cheese-making is more in your line, here in Canada, let me first consider the subject of

Curing Rooms.

I do not believe there is any one thing that has caused more failure and disappointment to cheese-makers than the lack of proper curing-rooms. The loss caused by this lack has been a hundred-fold more than it would have cost to supply curing rooms in every way efficient and satisfactory. I do not care how perfect and complete everything else may be up to this point, a bad curing-room and unfavourable weather will put the brand of imperfection on the cheese. The best milk and the best work may be spoiled by a bad curing-room.

The best authorities agree that for very rich cheese the temperature of the curing-room should be steadily maintained at 60 to 65 degrees; for ordinarily rich cheese at 65 to 70 degrees; for half-skims at 70 to 75 degrees; and for full skims at 75 to 80 degrees. Now, how many curing-rooms are there in Canada, or in the United States, in which the temperature can be regulated and kept at any of these points, or within any of these ranges? There may be such, but I confess I have never seen one. I think I am safe in saying that in a majority of them it is difficult to keep the temperature from going up and down just as it does outside of them. It requires but a moment's reflection to perceive that this must be very injurious to the quality of the cheese that is curing inside. Here is a fine chemical process going on which requires an even temperature of a certain degree; but all the while the temperature may be changing from a point too low to a point too high, and *vice versa*. We have not only a wrong temperature, but a constantly changing one, where we should have a stable temperature at the right degree. Somebody once started the theory that alternate freezing and roasting was the proper method of curing cheese. What a happy thing it would have been if that theory had proved true!

Most curing-rooms have some appliance for keeping up the temperature, more or less perfectly, spring and fall; but there is a shocking lack of provisions for keeping the temperature down in the hot weather of summer. I entered curing-rooms last summer in which the temperature was among the eighties, and sometimes the nineties were reached.

I saw the fat dripping from the shelves in the form of oil, and the floor was so greasy that I had to step with care lest I slip and fall! What could you expect in such a place but toasted cheese? You surely would not expect fine flavored, buttery and long-keeping cheese to be the result. The best curd ever made would spoil under such conditions. A poor, hard, sour cheese might not be injured—for nothing can injure such a cheese much. A high temperature might be beneficial to it, by helping to break it down. But a fine curd, put to cure in such a temperature, would spoil in a few days—yes, a few hours. Fermentation would go on so rapidly that it would huff and swell all out of shape, because the grease could not escape through the surface as fast as generated: and the finer oils would soon go off flavor if they did not leach out in a liquid form. Nothing but the worst of skims, or curd soured in the whey until all goodness is dissolved by the acid and washed out of it, can stand such a curing-room. Mr. L. N. Brown, of Gurnee, Illinois, has an ordinary curing-room. He engages in winter butter-making, and in the summer works up the milk of his strippers into cheese. He formerly soured the curd in the whey. This will make a curd hard enough to stand up. There is no question or dispute about this. But last summer he tried the sweet whey process—drew the whey sweet (which he found much better to feed immediately to his pigs and calves) and developed the acid in the curd. At first the cheese was too soft for shipping purposes, but excellent for the home trade. He not only retained the ash of the milk in the curd, but did not carry the acid quite far enough and get out quite enough whey before putting to press. Though not a learned man, he is a careful observer and natural experimenter. So he soon learned to hit right.

I think it a fact that when you draw the whey sweet and retain all the phosphates, in order to get a firm cheese you must work out more of the whey than you need to when

you cut out the phosphates and fine oils with acid—for the reason that both the phosphates and oils tend to make the cheese soft as well as richer and more digestible. By holding the curd longer in the vat, keeping up the heat, you expel the extra amount of whey required, as well as develop the acid and save so much fermentation in the curing-room. Hence, hurry in putting to press before these changes have occurred is what has caused so much failure by cheese-makers when they first try the sweet whey process. These are points which I freely discussed with Mr. Brown when I visited him, and hence I am sure that he understood perfectly well what he was doing. Besides, he was an old and successful cheese-maker in the State of New York. I mention these facts because I want you to form some idea of the intelligence with which he tried the experiment which I am about to relate.

When I visited Mr. Brown again, later in the season, he told me he had been trying some experiments, and had found that he could not make a cheese that would not huff and crawl on the tables in his curing-room unless he cooked very thoroughly and developed the acid well in the vat before putting the curd to press. When he did this the cheese stood up all right and was firm enough without being hard.

But one day other business was pressing, and he felt that he could not spare the required amount of time to devote to his little batch of cheese. So it occurred to him that he would try an experiment. He drew the whey as soon as he thought the curd was cooked so it would possibly do. He then threw on the salt, stirred it in and put the curd to press, without awaiting the usual development of acid. He said to me, "It was a great deal softer and sweeter than *you* would ever think of putting a curd to press." But he did not put it into his curing-room to cure. His experience had taught him better than that. He put it into his cellar, laying it on a table, and doing nothing whatever to it but to turn it over occasionally. The cellar was very clean, and wholly under ground. When I was there in July the thermometer stood in it at 64 degrees. This I know because he was then curing cheese in the cellar, and we tested the temperature in the presence of Prof. Harvey, of Mississippi. It was after this that he put his soft sweet cheese to cure in it.

I was at Mr. Brown's house again about the middle of October. We had some of that very cheese on the table. It was rather soft for shipping, but was as close-textured as butter, with a perfectly clean flavour and a delicious richness. The water had sufficiently escaped in curing to leave it fairly firm, and he said it never huffed nor swelled a bit, but stood as square from first to last as it did the day it was laid on the table. The surface was covered with mold and mites, which was the only drawback, but this caused but little waste.

Now, had Mr. Brown put that cheese into his curing-room it would have been difficult to keep it on the shelf. It would in a few days—when it got heated up and fermentation had fairly set in—have been as soft as hasty pudding. He had much trouble in this way with curds cooked, and soured a good deal more.

The result of this experiment was, to some extent, a revelation to me. I formerly had no doubt as to the necessity for a proper even temperature; but this seems to indicate that with a low, even temperature in the curing-room we can do almost as we please in dipping a curd and putting it to press. In this case the temperature probably, did not vary one degree from 64, and it ought to be said that all the conditions in the production and handling of the milk were right. I have no doubt the rennet used was sweet and nice. There were no taints or ferments present to injure the product. No factory receiving milk from a large number of patrons could hope to have all the conditions as favourable as Mr. Brown had them. But every factory might have just as good a curing-room as his cellar is. All that is required is such a structure as will secure a low, even temperature throughout the season. The marvel to me is that cheese-making has been carried on so long with such poor curing-rooms.

I will next consider briefly the question of

Rennet.

I shall deal more especially with rennet preparation for cheese-making. I am fully satisfied, after my observation and experience last season, that clean, sweet rennet in

cheese-making is second to no other consideration. Added to bad curing-rooms, I had the evil of tainted and sour rennet preparation to contend with. It was astonishing to me what horrid broth men with noses would put into milk, expecting the result would be clean-flavoured cheese. I heard a good deal of complaint about dealers palming off upon cheese-makers weak and unsatisfactory, and sometimes bad-smelling, rennet. But in most factories they prepared their own rennet. In nine cases out of ten the rennet was prepared in whey. The whey was none too good to begin with, and is never a proper liquid for preparing rennet in. The preparation lacked sufficient salt to keep it from tainting, and was vinegar sour. This lack of salt and the high temperature where the rennet jar or tub, was kept, combined to sour and taint the rennet preparation, and make it a most offensive smelling liquid. But nothing better was to be had. Occasionally I would find one who prepared his rennet in water, but for lack of salt there was almost always more or less the smell of carrion about it.

When good rennet extract can be had at a reasonable price, I think it preferable, as a rule, to the home preparation. But if one must make his own rennet preparation, he should very carefully select his rennets—get old ones if he can—and soak them in a weak brine of one pound of dairy salt to twenty pounds of water. When all the strength has been soaked and rubbed out, settle, skim, and rack off the liquid, add to it all the salt it will dissolve, so as to make a saturated brine, then put it into jars or barrels, cover or stop as nearly air-tight as possible, and set in a cool place to keep. There is nothing better than a saturated brine for preserving rennet or other animal material; but as with meat, it must be kept in a cool place. If the air is excluded, it is all the better.

The *American Dispensatory*, which is authority with all druggists and physicians, says:—"When gastric juice is completely protected from the air, it may be kept unchanged for a long time; but on exposure it speedily undergoes decomposition, acquires a very offensive odour, and loses its characteristic digestive property." Now, rennet preparations is very like gastric juice, and will undoubtedly keep better if excluded from the air. The composition of gastric juice is 97 parts water, 1.75 parts salts, 1.25 part pepsin, with a small amount of free acid, in 100 parts. A good rennet preparation would probably not analyze very differently, though it ought to contain a smaller proportion of water and a larger per cent. of pepsin.

Without pure, sweet rennet, free from decaying animal tissue and all ferments, I cannot see how clean-flavoured cheese can be made my observation is that flavour corresponds very closely with the condition of the rennet jar. In some factories you will not find a cheese thirty days old that is not off flavour. I have seen them, where bad rennet was used in excess, in which you could not find a clean-flavoured cheese that was ten days old.

I believe, as a rule, too much rennet is used. In fact, you cannot get a cheese fit for market in ten days without using too much rennet and curing at a too high temperature. Cheese made in this way is short-lived, and I believe it is short-sighted policy to make such cheese. It would be much better for all concerned, if less rennet were used, if we cured at a lower temperature, and no cheese were marketed under thirty days old. We should have a better product, which would go more rapidly into consumption, and this would help keep the market clear and command better prices.

I have spoken of "sweet whey" cheese. I believe

Sweet Whey Cheese

is a more appropriate designation than "sweet curd" cheese. The term refers entirely to the time of drawing the whey—that is, before it becomes sour. There is no such thing as a cheese without acid, nor can there be unless we can eliminate all the sugar. By drawing the whey sweet, we get rid of about nine-tenths of the sugar, and of course a proportionate amount of lactic acid in the curd. Before American cheese-makers adopted cheddaring, they were on pins and needles about the time for the acid to appear. It was a critical time; and it was well understood that the acid was liable to come on so rapidly and to such an extent as to spoil the cheese. I have been caught in this way mys

But when cheddaring was adopted and the whey drawn nearly sweet, this danger was obviated. Everyone said it was safer to cheddar, but no one said why! The reason is, plainly, because by drawing the whey early, we leave a minimum amount of sugar—all of which will turn to acid, but there is so small an amount of it that no harm is done. It will turn to acid any way, and may as well do it in the vat, as in the hoop or on the table. The cheddar is a close approximation to the sweet whey method. The only variation is, that we now draw the whey sweet instead of waiting for the acid to appear. The prior and subsequent treatment are the same.

In making loose curd cheese, the sweet whey method is more difficult. It is hard to keep the curd loose after the whey is drawn. Therefore, where a curd-mill is not used, it is the general practice to leave a little whey on the curd until there is an appearance of acid. This is objectionable, and I have therefore recommended drawing the whey just ahead of the acid as nearly as possible, and then salting the curd. I then keep the curd at 90 degrees or a little above, until the acid development has been completed. Many suppose that the development of acid is stopped the moment the salt is applied. This is a mistake. I doubt if it checks it at all. But lowering the temperature to 90 degrees probably does retard acid development; but it is an open question whether exposure to the air, by removing the whey, does not hasten acidulation as fast as lowering the temperature retards it. I am quite sure salt does not materially, if at all, check souring. I had to demonstrate this many times last summer. But still I did not make a scientific or accurate test by leaving a portion unsalted, keeping it in the same condition otherwise as the salted, to see which should acid first. This might be a good experiment to make.

With our present average curing-rooms I am satisfied that we must pretty thoroughly develop the acid in the curd before putting it to press. If I made any mistake in Wisconsin last summer, it was in not sufficiently emphasizing this point. There is such a tendency to hurry. The cheese-maker can wait all the afternoon for the acid to develop in the whey; but the moment he sees the whey drawn and the salt stirred in he is in a state of constant nervous anxiety to put the curd to press. It looks all right, and he is bound to take the risk and get through with his day's work. This is human nature and I found it hard to buck against it. As soon as my back was turned, and before I was out of sight on my way to the next factory, the curd would go into the hoops, hot and sweet. All bad consequences were charged to my account. Every teacher has had more or less of this kind of thing to meet. But thought and discussion follow, and in the end the truth comes out and justice is done. In this way the world progresses.

It is certain, however, that the old practice of souring the curd in the whey has had its day, and is fast going out. Even the advocates of the system do not follow it. They draw the whey much earlier than formerly. One may make a firm cheese by souring in the whey, but he does it at he expense of quality. He thereby cuts the phosphates and oils out and secures hardness by the loss of these valuable ingrediments. But he is liable to have a sour, clammy, slow curing mass, good enough to ship, perhaps, but not fit to eat. *Apropos* to this, I note in Prof. L. B. Arnold's book on "American Dairying," an allusion to the better way which I have been advocating. His book was published in 1876. It says: "Under the present state of things a cheese that will stand a voyage of 4,000 miles can hardly be called a fancy cheese. But a much fancier cheese than we are now producing, one that will stand shipping, can be made. To do this will require milk to be free from some of the imperfections which are now quite common; it must be transported to the factories in better ventilated cans; *it must be made with less rennet and less acidity; and it must be cured in an even and lower temperature.*" Strange as it may appear, it is a fact that, although I read the proofs of this book, I did not see the import of these words until I stumbled upon them after my own experience and observation had led me to the same conclusions, and this reminds me that the world is teeming with great truths which would be of infinite benefit to mankind if men had the eyes to see them and the disposition to appropriate them and put them to practical use.

Before I close I wish to call your attention for a few moments to another topic of current interest. I refer to the

Injustice of Associated Dairying.

Any system, to be enduring, must be just and satisfactory. If it is not, sooner or later the intelligence of those immediately interested will discover the failure to meet the demands of justice, and a remedy must be applied or the system will be abandoned. The injustice of the associated system of dairying has long been known, but the extent of the injustice has not been fully understood. The associated system of butter-making has brought out facts not before dreamed of. It is ascertained that the cream-gauge is no more to be relied upon than the wind as a measure of equity. It is found that a 16-ounce gauge of milk varies all the way from 8-ounces to 24-ounces of butter. The value of milk in other materials varies quite as much. It has been generally supposed that in the amount of cheese that can be made from a given number of pounds of milk there is not much variation—that the same quantity of one cow's milk, or of one herd's milk, will make about the same number of pounds of cheese. But this is far from true. The specific gravity varies 15 to 25 per cent. by the lactometer. In a factory of eleven patrons noted by Prof. Arnold, the amount of dried curd that could be obtained from 100 parts of milk, varied from six and one-half to eleven and one-fourth parts—approaching closely to a difference of 100 per cent. This is probably as good a test as could be made to ascertain the cheese-making value of milk. It shows such an inequality in value, and would lead to such injustice in dividing proceeds *pro rata* by weight, as to be positively startling. Yet this is the way by which all dividends at cheese factories are apportioned. It is discouraging to all improvement in quality, and stimulates the disposition to feed succulent food for a large flow of poor fluid, and even to commit the offence of watering for the purpose of gaining in weight.

In 1870 this question came before the American Dairymen's Association, which appointed a committee to suggest some measure for securing justice in making dividends. Prof. Arnold was the chairman of the Committee, and in 1871 made a report, which was accepted by the Convention. It contains the first and only suggestion for securing justice in associated cheese-making that I recollect to have seen or heard of. After stating the case the report says:

Take a per cent. glass and fill it to the top of the graduated scale with milk from the cans of one patron, and turn it into some convenient vessel, as a tin basin, to be treated by itself. Do the same with the milk of each patron, and place them in any situation where they will be equally warmed. A vat of warm water is the best, if convenient; if not, the basins may be floated in a vat of warm milk. Apply rennet to each alike, and when curdled, drain off the whey and let the curd be dried in any convenient way. It will usually dry in twenty-four hours by exposure to the air. If kept warm in the basins, it may be dried sooner. The most accurate way of comparing the curds would be to weigh them; but as the conveniences for weighing in such small quantities are usually not at hand in factories, the following method is suggested.

Put in a per cent. glass some certain quantity of water, say thirty parts, and then drop in the curd broken in small pieces, and note how much the water is raised by adding the curd, and the rise will show the per cent. of curd in bulk. Proceed in the same way with each mess of milk.

The report goes on to indicate the method of making dividends by this test. Multiply each patron's milk by the per cent. found, and use this product instead of the actual number of pounds of milk. Tests of the kind indicated could be made as often as any person interested might desire.

This would be quite similar in effect to the test applied to cream in the cream-gathering system of butter-making. Neither can give exact results, but they are an approximation to justice that may prove practically satisfactory. But without some test of quality, in both butter and cheese making, neither can be much longer tolerated by intelligent and progressive patrons. The robbery is too patent and too large for the best dairymen to much longer stand it. They will prefer working up their milk at home, as many large dairymen do already. Some of you may remember how last winter, in reply to my question, Mr. C. C. Buell, of Rock Falls, Illinois, in your convention at London, said he did not mix the cream of his herd with that of the patrons of his creamery, *because he could do better to*

work it up separately. This is the idea that is taking root in the minds of owners of fine dairy herds.

This question of justice—not only in the dairy, but in all departments of life—is one that we must sooner or later meet here, or be confronted with it hereafter. It is a principle implanted deep in nature, and one to which every instinct of the human soul readily responds. We must work up to it gradually, if not rapidly; and the closer we come to it in all our dealings, the better will it be for us and our posterity. Justice waits us all—somewhere.

In conclusion, let me suggest that we must not only institute equity, but adopt more accurate, uniform and scientific methods before we shall attain the fullest success in dairying. We must not be content with being partly right; we must be all right. Nothing must be left in the dark, or to chance, "Luck" is not a dependence that is sure to carry us safely through. We must know what we do, and work understandingly to reach the end in view.

Discussion on Mr. Curtis' Paper.

A Member.—Did I understand that you salted the curd after dipping?

Mr. Curtis.—Yes, sir; the only objection is we had to cool the curd somewhat to do it, but if we let the acidity develop, we had all the trouble of the sour curd system.

Mr. Barre.—Is there not some uncertainty as regards the amount of salt when it is wet?

Mr. Curtis.—Certainly; the wetter it is, the more you salt.

A Member.—Would you recommend the use of the sink?

Mr. Curtis.—Not where you are cheddering. Only for the purpose of saving work and helping you to keep the curd loose.

Mr. Ballantyne.—Why do you prefer the curd to mat in the vat instead of in the sink?

Mr. Curtis.—I would not care which way, only if you dip it into the vat you are likely to reduce the temperature. If you keep it in the sink you can keep your temperature.

Mr. Ballantyne.—I have experimented considerably as a great many of you here are aware, and with a great deal of care and attention. I do not pretend that my experiments are so chemically correct, but my experience is that we got different cheese altogether. Of course, a person must use his own judgment about all these matters, especially in the fall and spring, because many of the making rooms are very open and the temperature sometimes get very low, and in this case the curd would not ripen at all.

Mr. Curtis.—What kind of a sink do you use?

Mr. Ballantyne.—We had what we call patent sinks with perforated tin in the centre, but I find with some makers that they allow it to stand and stick fast, so we substituted slats, and in this manner the whey gets away with perfect drainage.

Mr. Curtis.—I prefer to raise the temperature to 98° and then keep it there until it is sufficiently ripened.

Mr. Ballantyne.—That is all very well in the fall. Practical experience shows though that at a lower temperature it will ripen quite as well though not quite so fast. I think with a lower temperature you get a little better flavour.

Mr. Curtis.—Do not you think it would be an advantage to construct your making rooms so you could keep them at an even temperature the year round?

Mr. Ballantyne.—Of the very greatest importance. We cannot too much impress upon cheese makers or factory constructors to pay careful attention to this matter. We must remember that the cheese is not half made when it is put on the shelves. They are often either killed with heat or cold and, often, too, when they are under the control of the makers, and it is a shame and a disgrace that with the experience we now have, and the

information at our command, that we should find the temperature in some places 40 degrees. It is impossible to get fine cheese under such circumstances. I do not care how fine the curd has been or how good the milk. I think a regular temperature in the fall of about 65°, as was suggested by Mr. Curtis, is the best. There are some makers you could not go into their curing room anytime but you would find the temperature right. Now are you all doing or trying to do the best you can in this respect? You should, as makers, all have ambition enough and be honest enough to try and do everything that is necessary in this regard. In some places they say it is too much of an expense to keep the temperature right, and in some places I have told them to buy the coal and I would pay for it myself; and it would pay us to do so. In the spring the temperature should be 75° or 80°, because it is of the utmost importance to have the cheese properly cured and ready for the market in time. If they are allowed to lie in a cold lifeless condition on the shelves, the chemical change that should be going on is neglected, and the result is a cold, lifeless, dead, pasty cheese that nobody wants to eat.

Mr. Spears now referred to the Act passed in 1868 with reference to the adulteration of milk, and said that it was sadly weak in certain points, and wanted to know if there could be anything done to protect the cheese makers from dishonest farmers.

Mr. Ballantyne.—I think the question of very great importance, but would suggest that it be laid over until the afternoon, as we have some papers on cheese making to be read now.

Mr. Richardson now introduced Mr. George G. Mc Adams who had come to read his father's paper on "Essentials and Queries in Cheese-making."

ESSENTIALS AND QUERIES IN CHEESE-MAKING.

By Robert McAdam.

More than forty years ago, when the writer of this paper began cheese-making, the quantity produced in Britain and America was very limited, and the means and appliances for making them were very few and simple. The sum total of skill applied in the manufacture of cheese was the simple routine handed down from mother to daughter, generally based upon "rule of thumb" principles. It is a fact, and only fair to state, that many of these dairymaids produced excellent cheese, which usually possessed good keeping qualities. The lords of the dairy world had not then invaded the precincts of the cheese tub, nor usurped the right to advise inside the dairy. Only when sale day came round did they put in an appearance and proffer their aid, no doubt afraid that the cheese buyer might depreciate or undervalue the product of those he was bound to protect. In process of time it began to dawn upon the minds of some of these bucolic lords that the province of dairying might be cultivated to advantage; and one by one, sometimes with reluctance, they began to take hold and learn to milk, but it was sorely against the grain, particularly so with Scotchmen. Their pride revolted, and some of them even emigrated rather than brook the taunts and sneers of wives and fair maidens at their awkward, clumsy, uncleanly methods, for in this particular man still falls short of female neatness. The awakening desire to make money by it induced men more and more to devote their thoughts, time and skill to this branch of industry. From 1844 to 1854 important advances in improving the quality of cheese in Scotland had been effected; men were gradually assuming the chief management, emulation was beginning to work and a spirit of willingness to communicate was dispelling the close, narrow reticence which was generally treasured as a cardinal attainment. The improvement then going forward received a further impulse from the discovery that the finest cheese in England were made in districts around the Mendip Hills, near the village of Cheddar, Somersetshire, England, where the benefits of using hot whey to aid in effecting the separation of the curd had become known. The cheese produced under that process had come to be highly esteemed and sought after, and were undoubtedly of superior quality. The production of this cheese was restricted to narrow limits for many years, and those who practised the method were very reticent about the details of the process, and had it not

been for the tact, enterprise and perseverance of some "canny Scots," the Cheddar system and its peculiar advantage might have still been restricted to the green vales of the West of England. There, is the finest and most perfect cheese still made. This is the system for you to imitate and carry out in cheese factories, as closely as circumstances will allow, and although it is the system ostensibly universally practised in America, it has become to a great extent buried under so many improvements as to impair the delicious richness of quality and flavour which is seldom found elsewhere than in genuine Cheddar. Under such a rapid spread of cheese production on this continent amongst dairy farmers unaccustomed to, and ignorant of, the care that milk needs, it is not surprising that the surroundings of the cheese vat have not yet come to be all that is desirable, nor that the benefits of scrupulous cleanliness are not yet sufficiently perceived or practised. Even where the very best is done under the circumstances, imperfection can be readily pointed out. It is much more easy to point out than remedy defects. I do not pretend to have a ready-made panacea to put right all the ills which lie in the path of cheese makers, but I will earnestly call their attention and also the attention of cheese factory patrons to points in the production of milk and the manufacture of it into cheese, which, if carried out in good faith, would tend to increase the quantity and improve the quality of factory products. The mutual advantage to be derived by cheese factory patrons depends very much upon the faithful performance of individual duties in the production of milk and the care bestowed upon it, to ensure delivery of it in perfect condition at the factory. This part lies entirely in the hands of the patron. It is common to hear patrons say, "If my milk is not right let the maker send it back." This statement shows that he who makes it is either ignorant or unreasonable, for the defect in the milk is often not possible of detection by the maker until it becomse developed in the process of making. Thus the patron is entirely to blame for the delivery of bad milk, and utterly unreasonable or attaching blame to the maker.

Dairy farmers who intend having their milk made into cheese, either at home or at the cheese factory, should consider how their milk can be produced of the best quality for that purpose. It is not enough for them to devote all their skill to the production of quantity. The quality and condition of their milk should be equally primary objects with quantity. The milk of cows pasturing upon rank, weedy swamps, or browsing where wild onions, skunk cabbage, young pines and many other rank-smelling weeds are found, is sure to acquire more or less of their peculiar odours ; and such milk is not well adapted to produce fine quality of either cheese or butter. Besides these drawbacks in many pastures, the spring and fall feeding, raised specially for the cows, such as potatoes, turnips, cabbage, etc., yield very poor quality. Farmers should consider quality of the first consideration, and apply their skill to the production of goods which in the smallest degree affects quality and be equally careful in selecting purchased food ; and also rooting from their pastures the shrubs and weeds which are detrimental. Good water has also an undoubted effect and should certainly be provided pure for dairy cows. The vocation of the farmer enables him to observe where evils of this kind exist, and it is certainly to his interest to remove them as soon as possible. The patrons of a cheese factory should specially attend to the milking of the cows, and make sure that impure milk from whatever cause never enters the milk cans, that the pails and milk cans are carefully washed and scalded every day, and the milk kept from contact with ill-cleaned vessels, impure odours and surroundings. The milk should be carefully strained, aerated and cooled to ensure its arrival at the factory in good condition. Each patron has an infinitely better opportunity to know the condition of their own milk than the cheese-maker can have, and anything amiss with it should be told the maker, so that any possible remedy or modification in working may be applied to lessen the bad effects. Co-operation in this matter is advantageous to all concerned. The preservation of the milk in proper condition over night by the patrons is a duty the neglect of which causes a general loss to the factory, and often baffles the maker to know the cause of faults which develop in the cheese, but which are not apparent in the milk or curd.

For instance the maker cannot be certain whether the patron (who carried home sour whey in his milk cans) thoroughly washed and scalded them. Unless this is faithfully performed, the germs of acid fermenting develops a peculiar flavour in cheese as it

begins to ripen, which ultimately affects its value. This is one of the worst taints of many, which can be distinctly recognized by their various odours. Several of these cannot be obviated or wiped out in the processs of making, and the patrons should know that these taints often arise from their neglect, and their removal is essential to the production of fine quality. This should be an object of peculiar care with every cheese factory patron, for it is well known that milk and especially cream is very susceptible of odours being readily absorbed and communicated to both butter and cheese, so as to be distinctly perceptible. The cheese-makers' duties will now claim attention. To them I would say that their task is much lightened by the easy access which they now have to the experience of their predecessors in the work. Forty years ago there was not to be found as much as four pages of any practical work on cheese-making. The writer of this paper feeling the want of such, was induced to write and publish the first practical description of a complete process of cheese-making. The principles therein stated, when properly understood and applied, have never failed to produce fine cheese. He does not pretend to have discovered a new or "my method," but simply to have learned and noted the practices of those who made the finest cheese, giving sound reasons for every act performed. Without entering into details repeatedly given, I will premise that—

Every maker should clearly understand the leading principles which should guide them in all the operations with the milk and curd. The former having been produced and delivered of good quality, the maker should use the strictest vigilance to preserve and maintain it so, and every act in the process should be carried out upon this line of thought. The leading idea should be to preserve the natural flavour of pure milk in the solid portion after its separation from the whey. When this idea has pervaded the minds of makers, they will not engage in modes of manipulation, nor permit practices during the process, which will injure or destroy those qualities which is the object of all intelligent makers to preserve.

When the milk is delivered, immediate care is required to regulate the salting and keeping it overnight at a temperature which will have it in proper condition at the required time next morning. These are essential points, and should be carefully studied and practically applied, whether the milk is kept overnight at the farm or factory. I have observed that some factories are so situated as to command a fine cooling breeze at night, even in the hottest weather. This feature is worthy of attention in selecting sites for cheese factories. There is assuredly a wonderful benefit derived in the keeping of the milk, which is apparent in the working of the curd. From this advantage makers should never fail to avail themselves in hot weather of giving their milk the full benefit of the cooling night breezes sweeping free through the milk-room. I suppose that here in Canada the nights are considerably cooler, and this advantage must have a very favourable effect upon the quality of your cheese products. Instead of going over the details of manipulation during the process, which has been so often repeated before your convention,

I will point out a few of the sins of omission and commission which have been omitted from, or engrafted upon, current practice. Patrons are frequently heard complaining about the "big ratio" of milk to the pound of cheese, and the loss accruing from the quantity of cream arising on whey vats. There is certainly some ground for complaint on these points. The question arises, What are the causes and cure for it? Now it must be borne in mind that by no process hitherto practised can all of either the casine or butter be extracted and retained from the whey and converted into cheese. But something very material in that direction can be effected, when due care is practised at every stage. When milk is badly kept the cream arises and solidifies more quickly than when it is well kept, making more loss from this source, and the best remedy which makers can apply, is to take off all the cream and warm it to 100 degrees, and return it to the vat just before the rennet is added. The thorough mixing then given holds the cream (which does not again come up so quickly after heating) until the rennet begins coagulation, thus equalising the richness through the whole vat and preventing loss. This is practised in the best English dairies; it is still more necessary in factories and should be made imperative. Again, much loss occurs from rash breaking up of the tender curd. This part of the process should be performed with extreme care and gentleness. It has often offended me to the very soul to enter a factory and see some dough-headed maker

smashing up the tender curd, utterly oblivious of the loss they are causing. Some makers are so careful that scarcely ever a trace of cream is to be seen on the surface of their vats during cooking or afterwards, and this fact shows that something is wrong when butter is seen on the whey in cheese vats; and this is so frequent that nothing is thought of it. Nevertheless it is a loss, and should be corrected as far as possible. After breaking the curd, the heating is effected by diffusing heat from a large surface of tin heated by contact with steam or hot water.

The contact of the hot tin with the curd endangers it from scalding, which unless very carefully done, liberates more or less butter, and this never again becomes amalgamated in the curd, but becomes rancid and gives off a peculiar disagreeable flavour in the cheese. This is a source of injury and loss, and makers cannot be too careful to obviate such injury. Heating in this manner is hazardous as well as expensive. In England a portion of the whey is warmed to 130 degrees and carefully returned, to raise the mass to the required temperature. I have often thought that an arrangement, safer and cheaper, might be adopted in factories with advantage. Besides loss from the cream not being retained and coagulated in the mass, there is frequently loss of casine in addition. Cutting up the tender curd is often performed incautiously, and the stirring during the cooking process is also done rashly, and continued at intervals until the curd is ready for dipping. This continued stirring separates considerable of the curd into very fine particles, the continuous stirring prevents them from adhering to the mass, and they thus being kept in suspension are drawn off in the whey and lost. Careful cutting of the curd, and the gentle stirring of it during heating, has an undoubted effect on the ratio of milk required for the pound of cheese. The kind of implement used is something, but the care with which it is used is much more. Steam or hand agitators, rakes, shovel breakers, or the hands, can all be worked to the lessening of the yield. Rough handling in breaking, stirring and grinding costs the patrons often more than the cash paid for making. This matter is one which is not sufficiently considered by makers, their object seeming to be to do the work with as few hands as possible.

Patrons would often have better returns if more help, skill and deliberation were brought to bear in running factories. To illustrate this point, I will state that last summer, in the course of our weekly visitations amongst factories, I entered one where there were four vats of milk, making over thirty cheese daily, three men were running it; they looked worn out and exhausted. A vat of curd was being ground in the sink by steam (rather slowly), and another was ready for grinding; the third and fourth vats also demanded attention. The curd being ground became repacked before salting could be done, thus rendering thorough salting very difficult to perform. Upon ascending to the cheese-room, I found puffed blotches on the surface of many cheese, and a distinct difference in the shades of saltness. Some being more salt on one end, I asked the maker the cause of these faults which he could not tell. I then told him that the curd (from repacking required more mixing of the salt than had been given it, that the puffed blotches arose from part of the curd not having received sufficient salt; that the salty ends of the cheese was caused by curd standing too long in the hoop before pressure was applied, the upper or softer end having been deprived of its full share of salt from the salt melting and descending. This maker was an experienced one, and usually made very fine cheese, but the desire to do with too little help, imperilled both his reputation and the returns from his factory. Buyers who understand cheese-making have facilities for observing such matters, and cheese-makers should never fail to give attention to the suggestions of experience. The yearly change of makers in many factories, and the first season of beginners, require special supervision by those most interested in their success, and the watchfulness of these cannot fail in being an influence for good. The essential requisites for making fine cheese are briefly indicated in the foregoing, and although no particular processes are detailed, intelligent makers will perceive and avoid all practices which conflict with the ideas set forth. There are numerous methods for performing the same work equally well, and the result in cheese-making is more dependent upon understanding and carrying out principles than from mere routine manipulation. There are many ways of making fine cheese, and those acquainted with but one method, are pecu-

liarly liable to imagine that they know it all. I will now put and reply to a few queries which may aid some makers on points where doubts beset them.

Q. Why is it necessary to regulate the setting of milk over night according to indications of atmospheric temperature?

A. Because milk changes slowly in a low temperature, but quickly in a high one.

Q. Is not the sweetest condition of milk the best possible for cheese-making?

A. No. Milk must be sweet but it is in the best condition when advancing towards the neutral state.

Q. Should makers use means to bring about this state of the milk?

A. They should use their best judgment to have it in this state regularly.

Q. How can this be effected?

A. By noting the temperature of the air in the evening, and setting or cooling the milk in accordance with indicated probabilities.

Q. How may the maker ascertain the condition of the milk in the morning?

A. By testing it with the thermometer, in smelling and tasting the cream and milk.

Q. When the milk is all in the vat and the change not sufficiently advanced, is it beneficial to delay setting to coagulate?

A. It is, but great care is necessary lest the change should be more than desirable.

Q. Why test the night's milk with the thermometer?

A. Because when the milk in the morning stands at 60° to 65° it indicates that it is well kept, and may be expected to work satisfactorily, but if it stands at 70° or 75° or upwards, sudden development is liable to occur, producing sour cheese.

Q. When milk is in the desired condition is there any danger of loss of cream?

A. There is always danger of loss of cream, unless it is skimmed off and heated to 98° or 100° and returned just before rennet is stirred in. With due care loss may thus be obviated.

Q. When cream is thus skimmed how should it be warmed?

A. By placing it in warm water at 150° and carefully stirring it until 98° or 100° is reached.

Q. When the cream and milk are in bad condition can it be made into fine cheese?

A. By skillful treatment it may be made into passable, but never into fine cheese.

Q. What is the best temperature for setting to coagulate?

A. About 80° in hot weather, up to 85° in cool.

Q. What effect is produced by coagulating at a low or high temperature?

A. At 75° the curd comes very tender, makes rich cheese, with big yield, but too soft for shipping; above 85° the curd is liable to be harder than desirable, losing in richness as the coagulating point is made higher.

Q. In what time should coagulation be effected?

A. In from fifty to sixty minutes.

Q. Should breaking be commenced whenever coagulation is sufficient?

A. Always; it is best to begin before the curd is very firm, cutting once each way, then waiting a few minutes and proceed until finished.

Q. Is there danger of loss after proper coagulation?

A. Loss often arises from rash breaking, also from careless stirring during heating up.

Q. Could this loss be obviated by using other implements for breaking and stirring?

A. The fault lies principally in using the implement roughly in the vat.

Q. What effect has scorching the curd upon the quality of cheese?

A. It liberates butter which does not cure with the salt, but becomes rancid and gives off an offensive flavour and hastens premature decay.

Q. What effect has rash or too much stirring?

A. It lessens the yield because the fine particles of curd pass off in the whey. It also has a tendency to harden the rind.

Q. Should rennet be ever used in excess to promote rapid curing of the cheese.

A. Never, because too much rennet promotes decay, not natural ripening, and if makers strive to get good keeping qualities in their cheese it is absurd to use in excess, an element which neutralizes this care, and destroys the quality they strive to impart.

Q. How can early curing be promoted without using excess of rennet?

A. By coagulating at a low temperature and light cooking and salting.

Q. What quantity of salt is needed for 1,000 pounds of milk?

A. The dryness of curd should determine the quantity of salt. One pound of salt to fifty-six of ground curd is a safe guide to go by. A shade less for early ripening and a shade more when long keeping is intended.

Q. When is it best to draw off the whey?

A. The first may be drawn off as soon as practicable, either before or during the process of cooking; the remainder as soon as acid is perceptible.

Q. Is it best to remove the curd to a sink after the whey is drawn, or allow it to remain packed in the sides of the vat?

A. It is immaterial as affecting the results; convenience may guide the maker without detriment. Æration is best done in the sink.

Q. Is grinding the curd essential to the production of fine cheese?

A. By no means; dipped curd often makes just as fine and solid a cheese.

Q. What is the principal point in the process of making which gives closeness of texture and solidity to cheese?

A. The proper degree of change or acidity just before salting determines the texture and solidity.

Q. When milk is in a fine condition is a less degree of change sufficient?

A. It is, because taints and their effects have not then to be overcome by increased changes.

Q. Does the proper degree of change ever make sour milk?

A. Never. Sour cheese is the result of bad milk, too much change, or unskilful making.

Q. What promotes fine flavour and richness in cheese?

A. The preservation of the milk in a pure condition, before coagulation, with cleanliness, care and skill in every part of the process afterwards.

Q. Whether does dipping the curd or grinding it yield best returns from the milk?

A. There is a slight gain from grinding.

Q. How is this result accounted for?

A. Many of the fine particles of curd are lost in the whey when the curd is dipped; these particles of curd adhere to the mass when allowed to pack for grinding.

Q. Is there any difference in the results from the various kinds of curd mills or cutters?

A. The cutters often make bad work unless the curd is put to press when soft and plastic; the smooth-cut surfaces of solid curd simply adhere. They never press into one solid mass (like curd broken into irregular fragments); they are apt to make a checquered

surface, which invite flies to deposit their eggs, breeding skippers; when tried or cut they part readily when the smooth edges come together, and they have occasioned heavy loss in some factories.

Q. Does sour cheese find favour in some markets?

A. No Nor is sour cheese made anywhere, unless from negligence somewhere. It is always a misfortune.

Q. Are any fine cheese made from curd where the change or acid is not perceptible?

A. By various methods fine cheese are made without developing any acid in the curd.

Q. Why are not some of these methods adopted in America?

A. Because there is less certainty of uniform success with these methods, especially in a climate so variable as our own.

Q. By the utmost care in any of the various methods of cheese-making, can all the solids be extracted from the milk and converted into cheese?

A. Not by any known method at one process.

Q. How much solids remain in the whey?

A. Fully two pounds in 100.

Q. Is this residue of good quality?

A. It is equally rich with that as taken.

Q. Is it ever used?

A. In England it is taken out and used on the table in the form of butter.

Q. Can anything be suggested on this loss?

A. Chemists might apply their skill in solving the problem and give us some practical method whereby all the solids may be saved, thus adding a fifth part to the value of milk for cheese-making.

Discussion on Mr. McAdam's Paper.

John C. Waters.—Did I understand you to say that cheese ground gives a better average than that not ground?

Mr. McAdams.—Yes sir.

Mr. Shaw.—Would it be prudent to establish dairies or creameries in sections where living water cannot be found?

Mr. McAdams.—If there is plenty of pure water, although not running water, it would do. If the water is in sufficient quantities and not infected I think they could still practise cheese-making.

Mr. Curtis.—Mr. Ballantyne, do you give preference to the cutting mill?

Mr. Ballantyne.—Yes.

Mr. Curtis.—I am glad to hear that, because I believe I first advised that that mill be used. It always seemed to me there must be less waste and a freer escape of the whey.

Mr. Mills.—Was it because it cut it differently?

Mr. Ballantyne.—The one that cuts it in square pieces does not sufficiently expose the curd to the atmosphere.

Mr. Mills.—How does Mr. McPherson's mill cut?

Mr. Ballantyne.—It slices it.

Mr. Morrison.—I would like Mr. Ballantyne's opinion whether it is better to make cheese to cure in 10 days or in 30?

Mr. Ballantyne.—I prefer the early cheese to be perfectly ripe in 10 days. The sooner they are ripe the more value they are, and the price is always higher then.

Mr. Morrison.—Supposing a maker had not enough for a carload and yet made his cheese to ripen in 10 days, cheese comes down in price so low they cannot be sold. What then would be done with them?

Mr. Ballantyne.—There is always a demand for them at that time. The sooner factories commence to make cheese to ripen early the better for them.

Mr. Steinhoff.—Would you advise covering the curd to keep it warm in factories where it is difficult to keep the temperature right?

Mr. Ballantyne.—By all means, in the fall and spring especially.

The Convention adjourned at 12 a.m.

SECOND DAY—AFTERNOON SESSION.

January 15th, 1885.

The President took the Chair at 2-15 p.m., and called on the Committee on Nominations, to report which they did as follows :—

To the President and Members of the Dairymen's Association herein assembled.

Gentlemen,—Your Committee on Nominations beg leave to report as follows :

For President .....T. Ballantyne, Stratford.
" 1st Vice-President. .....H. S. Lossee, Norwich.
" 2nd Vice-President .....H. Parker, Woodstock.

Directors.

Division No. 7.....R. Hay, Wyandotte.
" " 8.....A. Spiers, Caistorville.
" " 9.....E. Caswell, Ingersoll.
" " 10.....W. Messer, Bluevale.
" " 11.....John Wheaton, London.
" " 12.....L. Cleverden, Strathroy.
" " 13.....J. H. Masters, Cookstown.

All of which is respectfully submitted.

G. H. Cook,
Chairman.

Stratford, 15th Jan., 1885.

Moved by Mr. J. C. Morrison, and seconded by Mr. A. Z. Leach—That the Report of the Nominating Committee just read be adopted.—Carried.

Moved by Mr. John Craig, seconded by Mr. Adam Speers, and

Resolved,—That the Bureau of Agriculture of Ontario be memorialized by this Association to appoint a Commissioner for the Province of Ontario to attend the World's Fair at New Orleans to represent the Agricultural and Dairy interests of this Province at said Fair. That this Association would respectfully recommend Mr. H. Wade as said Commissioner, and now hereby respectfully memorialize the Bureau of Agriculture accordingly. —Carried unanimously.

Mr. Richardson now called upon Prof. Arnold to read his address, who, on coming to the platform, was received with applause.

Prof. Arnold then read his paper on "Dairy Products as a Food."

DAIRY PRODUCTS AS FOOD.

By Prof. L. B. Arnold.

It is a common remark that good health is the basis of all human happiness, and its truthfulness is generally recognized and admitted, but not so generally appreciated. It is recognized only in the abstract. The actual reality is evidently not fully comprehended. Confessedly, the end and aim of all human exertion is happiness. The hope of enjoyment is the motive power that pushes the hands, the heads and the hearts of men in every endeavour. No proof of this is needed. It is an evident truth. Now, if everybody had a clear and realizing sense of the fact that the foundation of his well being lay in the possession of sound health, everybody would be chiefly occupied in looking after that important matter, and with the greatest solicitude. He would, in every possible way, be studying the sources from which it is developed, maintained and restored, if by unforeseen events it should chance to be impaired. But the great majority do no such thing. The world of mankind with little regard for health lavish all their energies in the accumulation of wealth. They can appreciate riches or distinction better than sanitary conditions, and with undivided attention they work to the extent of their strength for gold or glory, with hardly a thought of their bodily welfare or mental sanity. With the multitude, matters of health are left to the doctors, as are those of theology to the clergy, and of law to the barrister. While all this is general, it is not universal, and it is gratifying that there is a growing tendency towards giving more attention to the care and maintenance of good health. Publications on health have a wider circulation now than formerly. The study of physiology and anatomy is gradually increasing in our schools, and in social circles conversation concerning the laws of health is more common than formerly. These influences are improving the hygienic habits of communities and nations, and, as a consequence, the average longevity of man, where these are operating, is slowly lengthening out, and the bearing of health upon human happiness is having a broader appreciation. All this is encouraging and gives reason to hope for better things in the future, but the world moves too slow. Progress lags when it ought to hurry. There is so much of human welfare depending upon conditions of health that it impresses the need of making haste to become better acquainted with the circumstances which modify and control it.

In unperverted nature, instinct and the senses serve to regulate healthful conditions, and seldom go wrong. But civilization has introduced so many artificial conditions, and warped and perverted instinct in so many ways as to make it an unsafe reliance, and to make it necessary that intellect should be drawn upon to aid in guiding and taking its place. It is a poor substitute, I admit, for instinct and the senses. I would rather trust to a very dull instinct and a pretty numb sense of feeling, sooner than the most capacious intellect, to tell me whether I was freezing or burning, or too hot or too cold. There can be no adequate substitute for these agencies which nature has provieed us with for self protection. But intelligence can be of great service in helping to protect, ward off, and restore from misfortunes which artifice has involved us in.

The plagues and pestilences which devastate cities are known to be the result of bad sanitary regulations which are avoidable and die away as their causes are better understood. The yellow fever, that terrible scourge of our southern cities, was kept out of New Orleans—the very home of pestilence—by the precautionary measures taken by Gen. Butler when he controlled that unfortunate city, and other cities could be protected as well. The Asiatic Cholera is a preventable disease, and can only exist where unfavourable conditions to health prevail. It finds a place of attack only where filth and morbid conditions already exist. When it attacks a city, the mortality from all other diseases runs down as that from cholera runs up, showing that it selects its victims from subjects on whom the grave already has a mortgage, and it is only a question of a little time by the means of which disease it shall be foreclosed. Cholera never flourishes in the country where pure air and other healthful conditions are observed. Epidemics, like fires, rage most violently in towns and cities, where there is the most inviting material to entice them. It is one of the great favours which countrymen, and especially dairymen, enjoy above the denizens of cities, that they are so little subject to epidemics and contagious diseases. But such

scourges are not, even when combined, the worst enemy to human health and happiness. There is an insidious foe lurking everywhere, in the country as well as in the towns, that sweeps off more victims every year than any other cause, and probably more than all other causes put together. That foe has its home in what we take into our own mouths. Things put into the mouth seldom kill outright. They work insidiously and by slow degrees undermine constitutions, poison blood, pervert and warp functions and induce morbid conditions that pave the way for the development and propagation of a multitude of ills to which civilized life is subject. We are too artificial in our diet, for our present information concerning the laws of life and the specific effects of food. We eat and drink foods that are imperfect nutrients, lacking some necessary elements, while others are in excess. Some contain infection and others are medicinal. We eat too little or too much, and take food too hot or too cold, and at unseasonable times. With a better knowledge of the properties and effects of things we eat and drink, they might be not only harmless but nutritious and healthful. But with our present information, our irregularities wear upon us, and pave the way for disease, of which one kind or another is pretty sure to overtake us before we get through the journey of life. In a state of nature, or in a state of perfect health, those who are not carried off by accident, die of old age. In our artificial way of eating and drinking, by guess, as it were, or under control of morbid instincts, only two and a half per cent. of the population die of old age. The statistics of mortality in the cities of the U. S., and England have shown this for the last fifty years. Perhaps as many more die from mechanical influences and epidemic, and the remaining 95 per cent. are prematurely carried off with the numerous diseases common to the country, the great majority of which can be traced to what goes into the mouth.

In view of the weighty consequences depending upon good health, and the controlling influence diet has upon it for good or evil; and in view of the fact that dairy products are all employed for human food, the thought occurred to me that a brief consideration of the part which these products play in sustaining life and health, might have something of interest for those concerned in their production, and hence the paper I have been invited to read has been designated, "Dairy Products as Food."

Milk is the first dairy product and the basis of all others, and is entitled to the first consideration. The milk of each species of mammals, when of normal quality, is a perfect food for its young. This is demonstrated by the fact that with milk as their only food, the young of all mammals live and grow and are perfectly nourished upon it, and maintain as good health as they do at any period of their lives, even when living under the most favourable conditions. Bovine and human milk do not differ so much but what infants can live upon the former, and grow and be perfectly nourished and healthful. These facts being conceded, the broad inference is made that a food which will sustain life and health and growth also, at one period of life, must at any time be, at least, able to sustain life and health without growth, and hence, that milk in a normal condition is of itself capable of supporting human beings in a healthful condition at any period of their lives, and is therefore a perfect food for human use.

This is current logic and passes for sound reasoning, and dairy writers are even pushing forward the claim, that milk is a perfect food for all times and seasons, but the logic is not quite sound. Let me ask your special attention while describing the requisites of a perfect food. First, as a broad definition, the constituents of a perfect food must comprise all that is necessary to supply the requirements of the consumer, and they must exist in nearly the same proportions that the consumer uses them, and the food must not contain much else.

To give a more minute definition, a perfect food for man and his domestic animals must contain nitrogenous matter (known as albumenoids or protien), for building up and maintaining flesh and tissue; 2nd, mineral matter, capable of building up and sustaining bony structure; 3rd, fat and heat-producing matter—starch, sugar, etc., known as carbo hydrates, for maintaining animal heat, and 4th, a certain part of the heat-producing matter must be fat ready for use.

To be a perfect food it is not enough that it contains all the ingredients necessary to support life, even if the right proportions of necessary materials can be extracted from it. It must not be loaded down with anything else that will be a burden for the consumer to

dispose of. To illustrate: potatoes are not a perfect food for man, not because they do not contain all the constituents of a perfect food, but because they do not exist in the right proportions. They lack in flesh-forming matter and have an excess of heat forming matter in the form of starch. If the consumer eats enough in weight to give him the necessary albuminous matter to supply the waste of flesh and tissue, he will be loaded down with twice as much starch, and eight times as much mineral matter as he can utilize. These must be disposed of. They must be cast out of the body soon or they will presently make trouble. They can be disposed of for a while without difficulty, but after a little, the organs which eliminate them will become jaded and give out, and then trouble will begin in earnest. On the other hand, if the consumer takes only enough to get what starch he can use and dispose of safely—he will lack flesh-forming matter for supplying waste of tissue, and he will eventually weaken, and if he persists will at length die of starvation.

Milk of average quality is a perfect food for infants, and becomes such because the child utilizes the whole of it, leaving no burdensome load to be disposed of. Along with the flesh-forming matter necessary to supply waste and growth of flesh and tissue, there is just mineral matter enough for building up its bony structure, and just fat and sugar enough to supply the necessary warmth and fat. And there is nothing left to tax its energies in getting rid of. And so long as this remains true, the child will grow and be healthy, unless something outside of its diet disturbs its equilibrium, and hence we say milk is a perfect food for infants.

When this child has become an adult, its demands for food will have become changed. Its bony frame and its flesh and tissue will have stopped growing, and they will only need enough of the special foods they require to supply waste. If the adult consumes just milk enough to supply fat and heat, it will leave an excess of bone-forming and flesh-forming matter unused, because milk contains enough of these materials, as compared with its heat-producing constituents, to supply both waste and growth, while only the proportion required for waste can be used—and the organs which eliminate these excesses from the body will be burdened with a task that does not properly belong to them, and which will wear them out prematurely. Hence we are forced to the conclusion that while milk is a perfect food for infants, it is not a perfect food for adults.

It does not follow from the foregoing conclusion that milk is not perfectly wholesome when used in connection with other varieties of food, which will balance its defects. Milk used with bread becomes a perfect food, the bread by its defective per cent. of albuminoids making a perfect balance with the excess of the same kind of matter in milk. Life and health can be indefinitely sustained in adults on a diet of bread and milk, potatoes and milk, or rice and milk, the excesses and defects in one balance those in the other, while neither one alone will long sustain life without faltering. Used in connection with similar foods, milk becomes not only one of the most wholesome and nutritious of foods, but also one of the most economical. There is but little difference between the nutritive value of a pound of steak, the bone in it being counted in its weight, and a quart of milk. The milk used with the same quantity of bread and potatoes that would be taken with the steak will support life quite as long and at less than half the cost of the steak. As a general rule, a given amount of nutriment in meat is twice as expensive as the same amount in milk. It is economy therefore to use milk to the fullest extent it can be used with safety to health. There is another objection to the exclusive use of milk besides its disproportion of solids. It is too liquid for adults. Its excess of water soon becomes burdensome if one attempts to make milk his sole diet. A superabundance of water may not be as objectionable as an excess of solids, but it is still an objection, as it causes a needless waste of vital energy to absorb, circulate, and excrete it, which in time becomes an exhausting tax that wears the user out prematurely. Those who use milk too exclusively acquire a plethoric condition from the absorption of an excess of fluid, giving an undue distension of blood vessels and vascular tissue, tending to dropsy, and causing drowsiness and a dull, sluggish habit in both mind and body, that makes mature manhood too much like infancy.

There is a further necessity for caution in the use of milk, from its liability to become affected by diseased conditions in the animals it is derived from. It has been proved to

be one of the most fruitful nurseries for every variety of ferment, and one of the readiest vehicles for the transmission of infection, whether taken in from the blood of the milk-giving animal or absorbed from contact with infected air. But this danger does not weigh against the use of milk as such. It lies only against the conditions under which it is produced and handled. All animal foods are subject to similar objections.

Condensed Milk

is much to be preferred for the use of adults to milk in its normal condition. The evaporation of more than half of its natural moisture, much better adapts its fluidity to mature life, and the addition of sugar to its excessive protien gives a better balance between flesh-forming and heat-producing material for the use of adults than exist in the native milk, but impairs it for the use of infants. The great advantage from condensing milk lies in its long and almost indefinite keeping.

Skim milk when used alone forms a more one-sided diet than milk in any other form. It can be better tolerated by the young and growing than the old, but it is unsuited to either, and should only be used in connection with foods that are drier and richer in starch. sugar or fat. Used in this way it can be made to form part of a perfectly healthy diet. It is better suited for young domestic animals than for human use.

To be a perfect food for infants, milk must be of the very best quality. This remark is not meant to convey the impression that it must be very rich in cream or any one of its other parts, but that it should be in as sweet, pure, and perfect condition as possible. Cows' milk as it averages when the milk of several cows is mixed together, is plenty rich in fat and other constituents, and often needs diluting. An excess of cream impairs rather than improves it for this class of consumers. An excess would be about as objectionable as a deficiency. It is important that it should come from a cow in good health and fed on sweet and wholesome food, for the quality and healthfulness of milk will vary with the character of the food from which it is made. To produce the best milk for infants, the animals giving it should neither be overfed nor underfed. One extreme would be as unfortunate as the other. Milk becomes vitiated when its secretion is over stimulated. In part, at least, milk is derived from decomposition of tissue, and when this goes on two actively, fragments of tissue break away without being perfectly dissolved, and may be seen suspended in the milk. Those that are small enough to pass through an ordinary strainer remain in the milk, and by their rapid decomposition, affect its flavour and its quality. Milk from cows giving rather a moderate quantity is to be preferred for infants' use to that from cows producing unusually large yields. When milk becomes irregular from extremes in feeding and secretions, it is greatly improved by filtering it through a sack of pulverized charcoal. Filtering through filter paper will improve it very much, but charcoal is better. The filter will catch all the objectionable solids, and the absorbent capacity of coal will take up all the prominent odours, and the milk will come out with a decidedly new and delicious flavour, and be much improved in a sanitary point of view, for whoever may use it. One who has never tried it will be surprised at the amount of offensive matter that will soon collect in the charcoal.

Cream.

I do not remember whether it was Mark Twain or Artemas Ward, whose lecture on "Milk" had its beginning, body, and ending, all comprised in this one simple sentence, "cream is the best part of milk," but whichever it was, spoke a veritable truth. There is no other part of milk, nor many things outside of milk, which seem to me to equal it in combining a delicious luxury with a variety of useful effects. It is a general favourite. If everybody does not use it, everybody likes it and is willing to use it if they can get it, and if all do not sing its praises, certainly no one lifts his voice against it. Yet notwithstanding all that has been said in its favour it is doubtful if its real value as an article of human food is fully recognized, since most people are in the habit of using milk fat in the form of butter. Though good and properly made butter may fairly be conceded to be the best and most wholesome solid fat in use, it is quite inferior to cream in respect to both

economy and health. The superiority of cream over butter, or any other solid fat, consists first, in its being not exactly in a liquid form, but in a condition allowing of great mobility between its particles, permitting the gastric juice to mix with it in the most perfect manner, and with whatever else the stomach contains, thereby facilitating digestion. Its behaviour is quite different in this respect from that of butter and other pure fats. As soon as they become melted they grease over the other contents of the stomach, obstructing, in a measure, the contact of gastric juice, and hindering, rather than hastening, the progress of their digestion.

Cream is also superior to butter and other fats from its being intimately incorporated with albuminous or flesh-forming matter in a condition favourable for easy and perfect digestion, so that while it serves the purpose of all unctious matter in developing animal heat and force, it carries along with it nutriment in a most readily available form—a very important consideration in the case of invalids. It is a fact in the functions of the human stomach that neither fats alone nor albuminoids alone are digested by it as well as when the two are mingled together in certain proportions. It does not seem to cope with any kind of grease alone, and pure albuminoids it digests with great difficulty. The flesh of lean animals which is defective in fat, never digests as well as that of animals in better condition, in whose muscles fat is mingled. The palate instinctively recognizes the difference between fat and no fat in the flesh of animals when used for food, always preferring that marbled with fat. A more perfect combination of fat and flesh-forming food could hardly be imagined than exists in cream, each fat globule of which it is composed being enclosed with an envelope of albuminous matter, and besides this, being suspended in a serum of similar character, making the incorporation of fat and nutrient matter as intimate as it is possible to make it.

Again, cream is superior to butter, because it contains more volatile oils than the butter made from it. This is often a matter of no little consequence.

The fat in milk is not a homogenous mass, though it appears such. It is composed of solid, liquid, and volatile fats which exist in every conceivable degree of attenuation, from the rock-like hardness of stearine to such an areiform condition as to act like gas. The lighter parts are in limited quantity, but are especially valuable to invalids for their enlivening effects and the ease and readiness with which they can be utilized. Fats, like other carbonaceous matters, undergo combustion in animal bodies by uniting with free oxygen. From the union we derive warmth and force, just as we develop heat and force by the combustion of other carbonaceous materials (coal for example) in a steam generator. The laws and effects of combustion are the same both in and out of animal bodies. The most attenuated matter burns with the greatest ease and rapidity. Shavings burn more readily and rapidly than solid wood. In illuminating oils, benzine and naptha burn with an explosion while the heavy oils burn with a slow and steady flame. So the solid milk fats, stearine and margarine, when taken into the human body, burn slowly, and develop heat and animal force too feebly for invalids, though vigorous persons utilize them readily enough. The volatile fats butyrine, caprione, and so on down through the different shades of attenuation to a gaseous condition, burn quickly and rapidly and develop warmth and force so easily and efficiently as to warm up and tone up the bodies of invalids when nothing else will serve them as well.

Persons consumptively inclined, those with feeble digestion, aged people, and those inclined to chilliness and cold extremities, are especially benefited by a liberal use of sweet cream. No other article of food or medicine will give them results equally satisfactory, and either as a food or medicine it is not bad to take. As an antidote for a tendency to consumption it acts like a charm, and serves all the purposes intended to be served by cod-liver oil with much greater certainty and effect. Where sweet cream can be had cod-liver oil is never needed. The volatile and easily appropriated unctious matter in cream, besides contributing directly to warmth and vigor, aids indirectly by promoting digestion for the same reason, and in the same way that other aromatic and attenuated oils aid the digestive function.

While cream has special merits for certain classes of invalids, there are no objections to its use by any or all other persons. It is an innocent, palatable, nutritious and health-inspiring luxury for everybody at all times. It is one of the special blessings which serve

to beautify the lives of dairymen, and which might very properly be used by them, and by all others who produce milk, much more freely than it now is, and would no doubt, meet with a more liberal use, but for the impression many have that it is an expensive luxury they cannot afford: yet it often happens that many, who for this reason restrict themselves in the use of cream, use butter which is a still more expensive luxury, with lavish hands. For the most part butter is only a luxury, while cream is always a highly nutritious and life sustaining food as well as a luxury, and hence the more economical of the two. Somehow the impression seems to prevail with most milk producers, that the one great and only legitimate end of milk and its cream is to make butter, and a sense of waste and misuse involuntarily arises whenever either is used for any other purpose, while in fact butter making is the least useful purpose for which milk is employed. A moment's reflection ought to make it clear that cream is more economical and valuable than butter, since it is equal to both butter and buttermilk. There is more fat in cream than in the butter that is made from it. Cream never churns perfectly. A part of its fat is always left back in the buttermilk, and is lost unless the buttermilk is also used. Cream is always converted into butter at a sacrifice of a part of its fat and all of its nutriment, involving a loss that makes butter much the more expensive when either could be used. It is a fact current among observing dairymen, that milk acid "cuts" the lighter fatty matters in milk and cream, and that if the souring is allowed to go too far, there is an appreciable loss in the yield of butter. The caseine in the buttermilk also becomes an absorbent of flavouring oils. What is lost in this way is more than the loss in weight of butter. It is the light but life-inspiring aromatic oils which have so little weight as seldom to be appreciable by the ordinary appliances for weighing, that are wasted. By the agitation in churning, what the acid and the curd in the buttermilk are made to absorb, is enough to make buttermilk the easily digested, invigorating, and wholesome drink it is rightfully credited with being—a very different thing from the lifeless and almost indigestible skim-milk, though it contains as much nutriment and as much fat, but of the heaviest and poorest quality. In converting cream into butter the butter loses all the buttermilk contains, while cream possesses all the good of both. By using sweet cream everything valuable is utilized, making its use a matter of great economy as compared with butter, as well as a means of promoting health.

I think cream also aids in digestion from its containing a moderate quantity of pepsin. Milk contains pepsin to the amount of about twenty per cent. of the quantity employed in cheese-making. When cream is separated from milk most of the pepsin the milk contained appears to go with it, and to stimulate the changes in cream which give to butter its most exalted flavour. Indications of the presence of pepsin pretty much disappear in skim-milk, which is an evidence that it goes with cream, and being there, is useful in its own digestion, and in the digestion of any other food which may be in the stomach with it. The sensations of rightness and ease which attach to it in the stomach, and the readiness with which it digests, it is quite probable are in a measure due to concentration in it of the pepsin originally in the milk. Some chemists also credit cream with something of excellence, from its containing an appreciable quantity of phosphates. How this is I do not know, having never examined it with reference to the minerals it carries. The claim that phosphates exist would be perfectly compatible with its influence as a good brain food, which it certainly is. I have often used it freely for that purpose and always with such satisfactory effects as to lead me to the conclusion that it is the best brain food I have ever used. Rare steak will stimulate more than cream, but leaves a feeling of exhaustion when its force is spent, while the sensations resulting from the use of cream are more those of a lubricant than a stimulant, making the wheels of thought roll along smoothly and without friction, enabling one to do more brain work with less fatigue than on any other food. Judging from my own experience, it would seem that steak stimulates or excites more than it nourishes, and that cream nourishes more than it excites the brain.

Butter

is by far the largest product of the dairy and the costliest and most wasteful of intrinsic value in its production. Twenty-five pounds of milk—the average weight required for making a pound of butter—would sustain a man's life well nigh half a month, while the

butter would supply bodily waste for hardly half a day. The life-sustaining matter in the form of caseine and albumen in the milk for a pound of butter would be just about equal to ten pounds of meat, all of which is sacrificed as a direct human food, and is only indirectly utilized as a by-product, to be fed to animals which, after sacrificing nine-tenths of its life-supporting ability, will return one-tenth in a new form, fit for human use—all for one pound of butter which is little else than a luxury—and not an indispensable one when it is done. It is but a pound of hydrocarbon, an effective equivalent for which science, at a profit, can replace at ten cents. When the thousands of the labouring poor in our towns and cities, in whose veins a kindred blood is flowing, are pinched and suffering for the want of just such food to keep soul and body together, is it a Christian work to occasion so large a sacrifice of useful food for a little luxury. No one will say nay, for we all do it.

After looking at butter-making as a naked reality and appreciating what a wasteful business it is, let us, as dairymen, console ourselves with the reflection that there is money in it, and that butter is not wholly a useless luxury. Milk-fats have some specific merits which are not to be found everywhere, and they could not be preserved and transported by any other means now at our command than by converting them as we do into butter. The special merit of butter as food consists in its peculiar composition and flavour, and its easier digestion than most other fatty substances. It differs from other animal fats in being exceedingly compound. Most fats are comparatively simple. Lard, for example, is chiefly olein with a little stearine mixed with it, while beef and mutton fats are mostly stearine with a little olein mixed with them.

Butter, on the other hand, contains all that other fats do and a great number besides. It consists of stearine, margarine, or palmatine, oleine and ten original volatile oils, or oils which are easily made volatile by a little deviation of temperature. These oils constitute the distinguishing characteristic of butter, and its flavour and chief excellence lies in them. They are in small quantities, varying from nine per cent. down to one-half of one per cent., averaging about two per cent. Remove these from butter and it becomes oleomargarine, which is a faithful imitation of butter with these oils left out. Besides the important consideration of carrying the flavour peculiar to butter, these oils are remarkable for their easy digestion. In fact they hardly need any digestion at all. They are already in a condition, with but slight change perhaps in some of them, to go at once into the circulation and be utilized in the production of animal heat and force. They are not only easily digested themselves, but they aid in the digestion of other fats of which butter is made up, and also in the digestion of other food. The light ones especially are exceedingly penetrating. They insinuate themselves between the atoms of stearine, for instance, and push them apart, as it were, and loosen their attachment to each other, making the stearine softer and more easily digested than it would or could be if they remained compact crystals. It does the same with the softer of the solid fats, and hence the whole of the butter is made more digestible from an admixture of a very diminutive quantity of those light oils. They give butter a great advantage over oleomargarine and other fats which do not contain them in respect to digestibility. They also aid in the digestion of other food. Lean meat, for example, becomes distinctly changed and more digestible from being treated with them. An attenuated oil will insinuate itself between the atoms forming the muscular tissue and weaken their attachment for each other, making the fibre tender and more susceptible to the action of gastric juice. It is in fact the beginning of digestion, for digestion simmers down to this in its ultimate effects. The office of pepsin consists in weakening the affinity which binds the atoms of nutriment together, till they fall apart and behave like atoms of water and virtually become liquid. Heat, as employed in cooking, aids digestion in the same way. It weakens the affinity between the atoms comprising certain parts of food, and makes the food tender. Heat begins the work and the gastric juice finishes it, and does so much easier than if heat had not been employed. Hence cooking and seasoning food with essential oils analogous to those in butter are not a matter of taste only. They both give a positive aid to the work of digestion.

Butter, as food, is better soft than hard, because soft fats are more easily and more completely digested than hard, and more readily and fully impress the taste. Stearine is the hardest fat and the hardest to digest, and the more there is of it in butter the poorer

the butter and the firmer and harder it will be. For intrinsic merit it is no recommendation to say of a sample of butter, "it is good, hard, firm butter," for it is an evidence that it abounds in stearine, the most undesirable fat of all for food. Though objectionable as food, stearine has its uses in butter. It resists change, and therefore promotes keeping. It gives to butter a consistency that makes its handling more convenient. Remove stearine from butter and its duration would be very much shortened, and its value as an article of commerce greatly reduced, and transactions in it limited. The commercial value of butter depends very much on its stearine. The more attenuated a fat is the sooner is it changed by oxidation. The best butter has proved to be the shortest lived. This makes it generally necessary and desirable to use butter while it is new. The value of butter as an article of food and of commerce is materially affected by the circumstances of manufacture. It has hardly been possible to make butter that would keep unchanged for any considerable length of time, and it has long been well known that the more butter is worked or handled or churned, or by any means disturbed, the sooner it becomes changed. The less it is worked the better butter will keep. To avoid the customary amount of kneading butter to separate the butter-milk from it, dairymen have adopted the practice of collecting the butter in the churn in granules, of the size of grains of wheat to that of peas, and then rinsing the butter-milk from the granules, instead of collecting the butter into a mass in the churn and working the butter-milk out of the butter, or, as is now more frequently done in such cases, partly rinsing and partly working the butter-milk out. The resulting butter is different in each mode of treating. The butter, when collected in granules and rinsed and carefully pressed into a compact mass after stirring in salt, will have the deepest colour, and a bright semi-transiucent appearance, and have the highest flavour and best keeping quality. The sample which has been most marked will have the palest colour and the lowest flavour, and will have a dull and salvy appearance and soonest spoil. These facts have become so well understood that the best butter-makers now all granulate their butter in the churn, and cleanse it of butter-milk by washing instead of the old plan of working, and thereby greatly enhance its value both for commercial purposes and as food.

That butter that is worked will not long keep its good flavour, all experience goes to show. Even a small amount of working spoils it for keeping. That it keeps better when handled in granular form, as above described, everyone who has tried it knows. Why this difference? why should making butter alter its flavour? why its colour? why alter its keeping? These are interesting questions certainly, and clear and explicit answers would, no doubt, be of very great interest to dairymen, and very likely, to enquiring consumers. I wish I could furnish them. But all I can do is to give my views. Before we jump at any conclusion let us run back a little. The fat of which butter is made is known to exist in milk in the form of minute globules. This is a settled fact. There is no question about it. The next fact that is settled is, that these little spheres, or globules, as they are generally called, are surrounded with a delicate covering of some sort, but just what that covering consists of is not settled. My view is that the covering is a membraneous one. Some think it is simply a very thin coating of the semi-liquid casein in the milk, the presence of which gives to milk its white colour. The weight of evidence, as far as I have been able to investigate, and I have had some advantages for doing so, sustains the membraneous theory.

Without stopping to detail the evidence from which I have deduced the conclusion, I will now give you my idea of the formation of a butter globule, fat globule, milk globule or cream globule, as it is variously called, which is that it starts from a nucleus of solidified stearine, and that it grows by the adhesion to it of other fats which circulate with the blood in a liquid condition. With such a method of development, the hardiest and heaviest fats would be in the centre of the little globe, and the softest and lightest outside, with others between them, the whole being arranged in a definite order according to density and gravity. When arrived at a certain stage of maturity the whole is enclosed in a delicate membraneous envelope, very much as an egg is enveloped in the ovary of a fowl. There is every indication that these little bodies, small as they are, have as definite an organization as an egg, in which the yolk surrounds a starting point, then a hard layer of albumen next to that, and a softer one on that, and so on, till the thinnest layer of albumen is out-

side, and is covered with a delicate membraneous envelope, upon which a tougher membrane forms, and finally a shell. One fat globule is done when the first envelope is formed. The globules are begun in the capillaries which permeate the walls of the cavities at the extremity of the milk ducts, through the walls of which they—the globules—crowd into the cavities, and are thence washed along through the tubes leading to the teats, whence they fall into the dairyman's possession and come to the surface of the milk pans as cream. The globules go thence into the churn, where, as I have supposed with many others, the agitation of the churn breaks the delicate membrane covering them and thus prepares them to adhere and form butter. This is the current opinion of the action of the churn, but the advance in microscopy does not sustain our old notions. The latest investigations indicate that we have all been wrong in the matter of churning, and in fact that when churning is properly done, the envelopes of the globules are not broken. When the temperature is right they are unctious enough to adhere, and do so adhere unless broken by unnecessary violence.

I learn by private correspondence that a performer of microscopy in New York city has recently been examining butter handled in granular form and found the globules whole and covered with an envelope. Upon examination after kneading, the globules were seen broken and the envelopes lying around empty and torn in all sorts of shapes, and the butter itself not in granules but in a pomogenous mass. It now seems, if these observations are correct, that when butter is properly churned, the globules after being cleared of the caseine adhering to them, adhere with their coats on, which, remaining on, serve to protect the contents they enclose and make it possible to keep butter so made a long time with very little change. But if, instead of handling the butter which has been so churned in a way to preserve the globules and their covering, they are kneaded and violently worked till they are broken and mixed up, and the pale and insipid stearine and margarine in the centre are exposed and brought to view, the butter will grow pale, and the light flavouring oils which had formed the exterior of the globules will be mixed up and obscured beneath the tallowy stearine, and the flavour, as a consequence, will be materially changed for the worse. In this mixed condition, the contents of the broken globules become similar to the contents of a broken egg, the taste and appearance become altered, and its contents, no longer protected from the air, perishes by the corroding jaws of oxygen or succumb to infection by organic germs. If we would have good, wholesome and palatable butter it must be properly churned and washed and in every way handled to avoid rupturing the globules or breaking the grains of butter, which means the same thing. It is just as impossible to keep butter with its globules broken as it is a poached or broken egg.

Cheese.

Cheese is the leading item of interest in Canadian dairying. As a nation, Canada has become the greatest cheese-producing people in the world in proportion to population, and I am happy to say she is as prominent for the quality of her cheese as for the quantity produced. With a population of 5,000,000, the make last year was, in round numbers, 75,000,000, lbs. or fifteen lbs. to each inhabitant. Of this amount, 58,041,387 pounds were exported, leaving for consumption 17,000,000, lbs or a little over three pounds per capita.

In the United States, with a population of nearly 60,000,000, the cheese product is only about 300,000,000 lbs. annually, or about five pounds per capita, about two-thirds of which are used for domestic consumption, giving a rate of less than four pounds to each inhabitant.

Thus it will be seen that your annual production per citizen is three times as great as ours, and we think our cheese industry a pretty large interest for our population.

As a State, New York produces a larger yield per man than Canada, her annual make of cheese being, in round numbers, 100,000,000 lbs. for a population of 5,000,000, which is at the rate of twenty pounds per head, but in our whole country we produce at only one-quarter of that rate.

The magnitude of your cheese interest makes the relation it sustains to the means of supporting human life, a matter of leading importance.

If "cream is the best part of milk," cheese is its most valuable part. Nearly the whole of the life-sustaining part of milk is centered in its curd. This gives to cheese a towering importance over any other form of milk products. Cheese, however, is not a perfect food, that is to say, it does not form a complete and perfect diet when used alone. It is not a well balanced food for a solid diet. It is too nitrogeneous. It contains more protien, or flesh-forming matter, for the respiratory matter that goes with it than can be made use of, and this, after a time, would become burdensome. The same is true of lean meat which closely resembles cheese in its constituents, only the per cent. of protien in cheese is much greater than in meat. If one were to live on cheese alone his health would sooner or later give way, and the same would be true with an attempt to live exclusively on any other single food, but one might live longer on some others than on cheese. It does not follow from this that cheese or any other food is not wholesome when used with those which contain what is lacking in it. When properly made and cured, and used in connection with foods abounding in sugar and starch to balance its excess of caseine, cheese is just as wholesome as any article of diet in use, but its highly concentrated richness makes it necessary that, in any connection, it should be used sparingly. It often happens that well founded complaints lie against cheese as food, on account of defects in its manufacture and curing.

To a considerable extent, cheese is rendered unpalatable and unwholesome from the use of badly prepared rennet. In at least one-half of the factories I have visited, both in the United States and in Canada, I have found the makers preparing their rennets in whey in a state of fermentation, and often in a state of putrefaction. It is impossible to make a fine flavoured or healthful food out of curd which has been leavened with such an infection. Cheese thus made, with the seeds of destruction planted in it, is of necessity short lived, unless by souring it is made so hard and dry as to resist all change—a condition about as unfortunate as if it was rotten. The defects growing out of the use of bad rennet are generally charged upon the patrons for delivering bad milk, but the real fault lies at the door of the makers. Not only are the flavour and keeping of cheese often injured from this cause but consumption is greatly restricted, and cheese producers and the whole cheese industry materially injured thereby. When all the cheese-makers shall have learned to use sweet and clean and wholesome rennet they will have made a long stride in advancing the merits of cheese as food and the welfare of the cheese interest.

The next misfortune in point of magnitude attaching to cheese grows out of a too free use of acid in manufacture. As I have often explained before, retaining the curd in whey till the latter becomes sour, dissolves out important mineral matters—notably phosphates—which are essential to nutrition and health. Curd does not have to lie long in sour whey before one-third of its mineral constituents are dissolved out and run off in the whey, doing the cheese quite as much injury as the removal of an equal per cent. of fat or caseine. It does even more, for besides injury from loss of mineral, the digestibility of the cheese is impaired, its curing put back, and the oils in the milk from which nutty flavour is derived are cut out and passed off in the whey, leaving a product faulty in flavour, faulty in composition and digestion, and unwholesome.

Putting sour whey into milk at the time of applying rennet, as some cheese-makers do, has effects in the same direction as leaving curd in sour whey, but less pronounced.

As an article of human food cheese is further affected from robbing the milk it is made from, of a part or all of the fat which belongs with the caseine. Milk in its best state has not fat and heat-producing matter enough to go with its curd. Cheese lacks still more in heat-producing constituents, because the sugar of milk is necessarily dropped out in converting milk into cheese, leaving it with only the fat for keeping up animal heat. If now the fat is taken away the remainder will be a still more one-sided food than before. It will be little else than pure caseine. It becomes more difficult to balance with other food, more difficult to make and cure, more difficult to digest and hence less healthful. The caseine in skim cheese seldom cures into a mellow and soluble food. It rather dries down and becomes dried curd, which digests so slowly and imperfectly as to affect its healthfulness and occasion great waste, as well as to make it objectionable in flavour. These defects vary very much in intensity, but to the extent of their existence they militate against the use of cheese as food.

There is one other peculiarity connected with the use of cheese which has an important bearing upon its food value and healthfulness. Reference is made to the state of curing when it goes into consumption. The curd of milk when newly formed is insoluble in water and digests in the human stomach with great difficulty. As the curd cures into cheese it becomes more and more soluble and digestible, and when thoroughly cured the entire substance becomes digestible and is readily available for food, making an old and fully ripe cheese much richer and more nutritious than an uncured one.

A cheese of average quality and ripeness at 30 days old has only about half of its nutritive matter digestible. The rest is wasted. The difference between new and old cheese in richness and food value is readily measured by the relative quantity of each which people instinctively use, the appetite being satisfied with a much smaller quantity of old cheese than new. Tests of digestibility in the laboratory correspond very closely with common experience in the use of cheese, making it a pretty clear case that the waste of nutriment from crowding cheese into consumption before properly cured is simply enormous. If cheese was made to cure a little slower and not allowed to go into consumption till well cured, its value as food would be doubled and its healthfulness greatly improved for it is its green and indigestible condition rather than anything in its necessary composition that is the chief cause of objections made against it on the score of health.

It must be evident that it does not comport with the welfare of consumers or the interests of dairymen to crowd upon the public cheese or other products in a condition unfavourable to health or usefulness. There may be a temporary gain, but the bad name it inflicts will react in the end.

That the products of the dairy as now offered, whether consisting of milk, butter or cheese, are not quite up to their highest possibilities will be apparent from the foregoing brief review of their merits and demerits. It is also evident that higher attainments are within reach, while a broad field for improvement stretches beyond, which will require long years to explore and make familiar, and the field is promising. By entering it and labouring to promote in all the goods it contributes to the dietary of the world, health inspiring conditions and the highest possible intrinsic value, the dietary industry would attract to itself both patronage and honour, and to this end the best efforts of every dairyman should be directed.

At the close of his paper Professor Arnold said that the microscope shows that the globules stick together without the coverings being broken. Take that butter and work it as he did: He laid it on a smooth surface, and worked it until he supposed he had broken them all to pieces, and then he looked at them again and saw the coverings scattered all around and the fat all mixed up. It had changed colour. When he took it away to test it it was high coloured, but after it was tested in this manner it was white, and also tasted differently. It is just like breaking a grape, it lets the flavour out. You break the globules in the butter and you get the flavour, you expose it. Hence the importance of knowing how to churn. It is wrong to work any butter. If it is simply washed and put in brine, it will keep an almost indefinite period without any material change that you can discover, just the same as you can keep eggs by keeping their integuments whole.

Mr. MILLS.—Have you seen that method of preparing butter tried?

Prof. ARNOLD.—Yes, this summer.

Mr. MILLS.—Just washing it?

Prof. ARNOLD.—Yes, sir. Last May I got a tub made, with a cover to fasten over it, and filled it with brine from the best salt I could get, boiled and skimmed the salt and used it in the tub. I kept the brine always over the butter, and had the lid arranged so as to exclude the air. I simply washed the butter and put it in the brine, always keeping the butter covered with the brine. I put it in last May, and I tried it the other day and could not detect the least change in it.

Mr. MILLS.—Was it in a cool place that you kept it?

Prof. ARNOLD.—In the cellar. I was afraid my housekeeper had spoiled it for me. A while ago she burned some brimstone without my knowledge in the cellar, but on

examination I found it had not injured it the least. The vegetables in the cellar had no appreciable effect on it either.

Mr. MILLS.—Do you attribute that to the brine, and will it stand exposure to the air more than other butter?

Prof. ARNOLD.—It will.

Mr. ASHLEY.—Would not the brine make it too salty for eating?

Prof. ARNOLD.—No; we took out what we wanted to use, and after washing it, set it at about 65 degrees until it got a little soft; then pressed it together with a butter ladle; when it was ready for use, we salted it about half an ounce to the pound.

Mr. RICHARDSON.—How many times did you wash it?

Prof. ARNOLD.—Till the water was clear that we washed it with. This is not an original thing now with me; I discovered it, I believe, nine years ago. I found people were gathering their butter in that way.

Mr. MILLS.—How many waters did you put it through?

Prof. ARNOLD.—About three.

Mr. MOYER.—How would you do for commercial purposes?

Prof. ARNOLD.—Keep it in brine until ready for market, and put it up right on the market.

Mr. MOYER.—How long would this butter require to be in the brine to make it salty enough?

Prof. ARNOLD.—It never gets salt at all. It is sweet as it comes right out of the brine—sweet as it ever was. The salt will not penetrate the skin or covering of the globules.

Mr. BARRE.—What is the best method or system to get the best results?

Prof. ARNOLD.—The principle is to agitate the cream, with producing as little friction as possible; a yielding pressure like that produced in a churn with a dash is best.

Mr. CRAIG now read the following report of the Auditors:—

To the President, Officers and Members of the Dairymen's Association of Western Ontario:—

GENTLEMEN,—We, the Auditors, beg respectfully to report that we have examined the books of the Treasurer, subsequent to audit of 1883, and hereby certify that we find the accounts correct, vouchers for the several payments being duly signed by the President of the Association:—

INCOME.

Balance from last year	$323 39	
By proceeds of Convention at London	306 25	
" " Government Grant	1,498 00	
" Cash from Secretary for Dairy Instruction Fees by J. B. Harris	25 00	
" Proceeds of renewal note for $500	488 55	
		$2,641 19

EXPENDITURE.

To Expenses of Directors at Board Meetings	$56 25	
" Grants for Provincial, Toronto, and London Agricultural Exhibitions	300 00	
" Postage, telegrams, and petty expenses	35 81	
" Auditors' fees	8 00	

To Expenses in connection with Convention at London.	$49 54	
" " to Toronto in connection with Report....	39 88	
" Cash retiring note for $500 for renewal	500 00	
" " " $500 paid in full	500 00	
" Expenses, advertising, etc.....	102 25	
" Lectures at Conventions and expenses	519 60	
" Secretary's salary for 1883, $200; part payment of salary for 1884, $100	300 00	
" Treasurer's salary for 1883	30 00	
" Expenses for Reporter	50 00	
		2,491 33
Balance on hand.....		$149 86

JOHN CRAIG, }
J. S. PEARCE, } Auditors.

Stratford, 15th January, 1885.

Adopted.

Mr. J. B. HARRIS, of Antwerp, N.Y., was now called upon to read his paper on "Dairying in Scotland."

DAIRYING IN SCOTLAND.

By J. B. HARRIS, ANTWERP, NEW YORK.

I was much pleased to receive from your Secretary an invitation to be present on this occasion, more especially because I knew it would give me an opportunity to again meet with many old and highly valued friends in this section of the Province, and because I knew that by meeting with you at this time I should be able to learn something of the prosperity and progress made by you since your last annual meeting, and also preserve my identity with this, one of the most splendid of Canadian industries.

At the very outset I must take occasion to bestow upon you a well-deserved compliment. During the last twelve months I have learned that in cheese making Canada leads the world; and when I say this, I do not wish the remark to pass as a mere indulgence on my part in a little meaningless hyperbole, but I wish it distinctly understood that in the great cheese markets of the world, *Canada stands second to none.* On the 4th day of November last I was standing in a commission house in the city of London, England, and saw two extensive dealers in cheese examine his stock with a view to purchase a large quantity.

Sample after sample of State cheese from this dealer's extensive stock were brought forward and promptly rejected. At length the proprietor caused a sample of Canadian cheese to be brought forward, this, the two gentlemen carefully examined, and immediately left their order. These gentlemen, evidently, understood their business; at least, such was my opinion, for I examined the samples with them, and the Canadian cheese were at least two grades better than the best State I saw. Indeed several of the leading cheesemen of Great Britain told me that, with the exception of four or five English dairies, Canadian cheese was the best in the market.

I understand that in the first nine months of 1882 you shipped to Great Britain 233,509 cwts.; in the same months in 1883, 324,418 cwts., and in 1884, 385,482 cwts. This shows an enormous increase, which you will find, if you take the trouble to investigate the matter, you have won at the expense of your neighbours south of the lakes.

In the game which the commercial world calls competition, superiority in quality is the winning card, and this it seems you at present hold; be steadfast in your efforts to excel, and the game is yours. Wise and judicious management on the part of the Dairy Association of Eastern and Western Ontario has given the Dominion a strong lift up the steep

declivity of success. Another lift, gentlemen, and like Alexander, there will be no more worlds for you to conquer.

In the fall of 1883 the dairymen of Scotland, perceiving that for some cause they were being excelled in the London market by the Canadians, began to cast about them for some means by which to keep pace with their Western competitors. As a first step toward the accomplishment of this result, they called a meeting of the dairymen of Scotland to be held at Kilmarnock, which resulted in the organization of the Dairy Association of Scotland. This society is not yet completely organized, but the spirit of enterprise is in the hearts of the Scottish dairymen, and the impetuousity and pluck that won the field at Bannockburn is destined to characterize its future operations. They are resolved that whatever intelligence, perseverance and money can do in the way of improvement in the manufacture of butter and cheese shall be done, and if the observations I made during my last summer's residence in that country are correct, their chances of success are excellent.

In geographical extent the cheese district of Scotland, comprising the counties of Wigton, Kircudbright, Dumfries, Ayr, and a part of Argyle, is perhaps not larger than the area embraced within the limits of your four counties of Oxford, Middlesex, Perth, and Huron, and in this small section the waste or unoccupied territory is much greater than in the Canadian counties named. Thus it will be seen that by reason of the narrowness of the dairy belt of that country neither Canada, nor the States have much to fear from their Scotch competitors in the markets of the world. And I do not understand that it is expected by the Scotch dairymen that any great accession to their boundaries is ever to be expected, and so it remains as a natural consequence that whatever impression they succeed in making upon the English market must be in the direction of quality. Although I cannot speak authoritatively, my opinion is, there is more cheese produced to the square mile ofScotch dairy country than there is to the square mile in the Canadian counties above referred to. This fact, however, does not materially alter the case. Scotland, in winning her laurels, must ever look to the quality of her products, as on the score of quantity she has nothing to expect.

In climate, water and pasturage, our Scotch brethren it seems to me have the advan tage. In the first place, their winters are not nearly so severe as ours, and, as a consequence, less of the profits of the season are required to carry the dairy through to grass the following spring. Again, I am inclined to think that upon the whole the Scotch dairy at the commencement of the season is in better condition to perform the requirements of the summer than are ours. Our long winter, our cold and badly ventilated barns, our imperfect methods of feeding and watering and the insufficiency of our food in quality as well as quantity in this country, starts us off at the beginning of each season with a family of evil effects which our summers are hardly long enough to correct. The foddering period is about as long with them as it is with us, but the mildness of their climate in a great degree dispenses with that necessity for vigilance and painstaking in the care of their herds which *should* characterize every State and Canadian dairy during our long and intensely cold winters.

From the 5th of March last until the 21st of the following November, the period of my sojourn in that country, although I took no notes it occurred to me that the temperature was less fluctuating than in Canada, and, I had a notion that on account of the close proximity of the sea in either direction there was a moisture in the atmosphere grateful to the grass and vegetation about me that you do not experience here. There occurred, however, in the month of June, quite a serious drought which continued for three weeks and made itself felt all over the dairy section. This, however, I was told was an unusual occurrence, and that generally the pastures were good throughout the entire season. Anybody at all familiar with the world's geography, the world's history, or the world's poetry, knows the hilly character of Scotland, for

> "Auld Caila's plains an' fells
> Her moors, red brown wi' heather bells,
> Her banks an' braes [illegible] dens an' dells
> Where glorious Wallace
> Aft bure the gree, as story tells,
> Frae Southern billies"

have somehow succeeded in mixing themselves up with the world's affairs to a rather remarkable extent, considering the size of her territory and the rather limited number of her children.

One need not peruse very far the writings of Scotland's most gifted poet to learn how her surface is interlaced with a network of silvery streams, whose limpid waters leap her rocks and plough her valleys from the mull of Galloway to Johnny Groats. These streams fed by the snows of her mountains and the mists of the deep are of the most lively and pure character, an item not to be overlooked in considering the physical character of a country from a dairyman's standpoint. Indeed, we believe as a general rule dairymen do not appreciate the value of pure living water as an item in the successful management of their business.

As a rule, the Scotch dairy farm is larger than the Canadian. In the counties of Wigton and Kircudbright, I believe they run from two to five hundred acres, and, if my observations were correct, these farms maintain a larger number of cows than the same acreage in Canada. This is due largely to the extent to which root culture is carried on in that country. I visited farms where I saw fields of at least one hundred acres of turnips and mangles, which I was told would yield from twenty-five to forty tons to the acre. Now, while I do not regard turnips as a very excellent food for cheese or butter purposes, I must say that as a winter food in that mild climate they do keep stock in excellent heart and health. Another reason I gave why the Scotch farmer can keep more cows on a given territory than we do is, the amount he expends annually in manures. I have known farmers to expend as high as £4 per acre for artificial manures; these facts, together with the other fact already mentioned, viz; the mildness of the Scotch winters, enable him to excel us in the size of his dairies.

Buildings.

With reference to dairy buildings I must say for warmth and general substantialness of structure, they appeared to me almost ludicrously out of proportion to the requirements of the climate, and, while looking them over, I was often constrained to exclaim what a pity that such buildings are not universal with the dairy farmers of Canada where the need for them is so much greater. Substantial stone structures with slate roofs, built not to subserve the needs of a few fleeting years but to resist the storms of centuries, universally charcterize the dairy farms of that thoroughgoing country.

With reference to the general plan and use of barn room, however, I would say I am not so sure about the wisdom of their method; one never sees in that country a building corresponding to the American or Canadian barn, but, instead of this, a quadrangular collection of byres inclosing a court corresponding in some respects to our barnyards. These byres are sometimes a hundred feet in length and are generally twelve feet in width. Sometimes they are built for two rows of cows and then they are at least eighteen feet in width. The walls are always of stone of a height to the eaves of from eight to twelve feet, with here and there sections of drain tile laid in for the purpose of ventilation. The roofs, generally gabled, are universally slated. On the court side of these structures a number of commodious doors placed at convenient intervals afford ample means of egress, regress and light. The floors are always paved either with stone or brick, with a drop of perhaps six inches immediately in the rear of the animal. These drops are gutters of perhaps a foot in width with an incline towards one end to carry off the liquid manure. In these instances where two rows of cows are sheltered in one byre, a raised platform or walk perhap four feet wide, paved like the floor, separates the gutters. It will be seen from this description that the byre is built exclusively for housing the dairy, there being no space in them that is ever used for the purpose of storing fodder. The byre is divided into spaces or stalls each wide enough for two cows, the partitions being generally a slab of stone, in size three by four feet, and from two to three inches thick, set up edgewise and supplied with a staple on either side for the purpose of hitching. A chain about the neck just long enough to prevent interference one with the other is the universal method. The stalls are each supplied with two burned clay boxes about six inches deep and two feet long and fourteen inches wide. These boxes, the only food receptacle provided, are the most serviceable for root and grain feeding.

In addition to the byres the Scotch dairy farm is always supplied with a sufficient number of horse stables, carriage and implement houses, but no storage is ever provided for unthreshed grain or fodder. To the American the number of stacks to be seen after harvest on a Scotch dairy farm is something wonderful. A hundred neatly-constructed, beautifully-thatched, carefully-roped, symmetrical stacks of unthreshed oats and other grains standing in ranks like well-drilled soldiers, is a sight not common to the American eye, and as he looks upon them he not unfrequently will be led to wonder why the material used in the construction of the long byres and stables was not brought together and great barns erected, as in this country, where stock and produce might be housed under a single roof. On account of the extreme moisture of the climate it is impossible to house their grain. There is another feature in Scotch dairy buildings which in passing I must not overlook, and that is what is called the midden. A rectangular bin generally in the centre of the court above mentioned, consisting of four stone walls from four to five feet high, enclosing a space sometimes a hundred feet long by fifty wide, and sometimes roofed and used as a manure storage, is a distinctive feature of the Scotch dairy farm. These institutions, when located at a proper distance from the point where the milk is drawn and handled, I can but regard with much favour, and I hope the time will come when the dairymen of this country will learn to appreciate as these men do the value of manure and will take as much pains to preserve it and apply it to the soil.

As soon as the grass begins to fail, which occurs generally in October, feeding begins. The cows are milked always in the byres and it is there they are fed. After turning out in the morning the gutters are cleared out and floor and gutters washed down by a copious application of water; this operation complete, and the clay boxes, already described, are immediately filled with turnips, five or six in each box, as a mess for the evening, and again at night after turning out the boxes are refilled for morning. Sometimes, however, in addition to the turnips a pound or more of cotton oil cake, or perhaps a proper quantity of oil cake, mixed with bean or Indian corn meal, constitutes the mess. This system continues until winter feeding begins, when in addition to the food already mentioned, a sufficiency of oat straw is distributed. This is done generally by the women in a manner which, to say the least, displays small regard for the value of time. It is carried in the arms from the straw house at one end through the long byres sometimes a distance of 150 feet and deposited at the heads of the animals, an armful to every two cows. This performance, as will be readily seen, considered from a pedestrian point of view, is no insignificant feat, especially when we remember that the dairy may consist of seventy-five to 125 cows, and that it must be performed generally three times a day. In the counties of Wigton, Kircudbright and Dumfries very little is raised, owing perhaps to some unfavourable condition of soil or climate, but the oat is always a successful crop, and thus it transpires that oat straw constitutes the bulk of the coarse fodder. Every well-constituted Scotchman has a prejudice that oat straw is better relished by the dairy when newly threshed, and consequently each day's supply is threshed in the morning, except Saturday, when the supply for Sunday is run through in addition. Fortunately for these people, nature has supplied almost every farm with a water power, of which he avails himself in the performance of this work: indeed, we believe that ninety per cent. of the dairies we visited own and ran their own threshing mills. Sometimes the turnips are sliced or pulped in a machine run by water, steam or hand power, and the cut roots mixed with chaff. This method, I have no doubt, has its advantages, but when the mass is allowed to stand until it becomes sour, a practice I have observed on the part of one or two, it has its objections also: indeed, it seems to me highly obnoxious in the production of cheese, as I hold that all species of acidified food is detrimental to the quality of that product. The feeding is kept up with much regularity and care from some time in the month of November until about the middle of May, when the grass in the pastures has become large enough for turning out.

In that country the sensitive observer of dairy practices is not pained at the spectacle of the pinched and shivering herd wandering slowly in single file along the snow path, through the storm to yonder hole in the ice, where one by one, on bended knees, the thirsty creatures eagerly transform themselves into animated suction pumps, and extend

their bodies with a twenty-four hour supply of the life-giving fluid ; an abundance of pure, living water is always at hand on the Scotch dairy farms.

Breeds.

Perhaps it is unnecessary to state to this intelligent audience the fact that the breed of cows used in that country in dairying is universally Ayrshire, a breed which some persons who have investigated the subject claim to be a cross between the High Kyloe and the channel island breeds ; nor is it necessary to say that every true Scotchman believes as firmly as he believes in the "Auld Kirk," in the superiority of that breed over every other for milk-producing qualities. Although an intensely nervous and excitable race, yet it must be said that for dairy purposes they rank with other breeds. For while their yield averages with that of any other, they are small-bodied and require less food and are doubtless better adapted to the hills and climate of that country than any foreign breed would be likely to prove.

Every dairyman engaged in breeding has a strong incentive to excel in that part of his business, for in addition to the natural advantages arising from success, a prize called the "Derby" is offered to every one who accomplishes a given feat in that direction. An animal, say of the age of one year, exhibited at the Ayr show with specifications of the purpose for which it has been selected, will entitle the owner, when the animal is returned to the exhibition two years later, to a prize of £5, more or less, if the object specified as that to be accomplished by the selection has been attained. As the "Derby" has been kept standing by the Agricultural Society for many years, great acuteness and perception has been developed among cattle breeders in the art of selection, or at least in the art of fixing up the exhibits to deceive the eyes and confound the judgment of the judges.

I attach great importance to certain peculiarities in the method adopted by these people in raising stock for the dairy. The calves selected for raising are fed new milk for a time long enough at least to start them on the road to a strong and healthful maturity. After the new milk supply has kept up for a time long enough to warrant a change, a mess consisting of thoroughly-boiled bean meal and oil cake or other nutritious substance in scalded whey, is kept up until the animal is old enough for the pasture. In this way the blight and stunning effects of unwholesome and improper food are avoided, and well-developed and meritorious dairies produced ; moreover the cows are not generally milked until they have attained the age of three years.

Leasing Farms.

A landed system similar to that which William the Conqueror introduced into England prevails. The great estates are divided into farms large and small, as already described. These farms command a rent of from £1 to £3 per acre, a rent it will seem enormously above the highest figures ever paid in this country, especially when we remember that this pays for nothing but the bare land and buildings. The leases are made for a term of nineteen years, and provide for semi-annual cash payments. The tenant having secured his farm must provide himself with teams, farm implements, help, seed, and everything necessary to the carrying on of the business. When this done, if so inclined, he sub-lets the dairy to one called a boore, who, at a given price, say twenty stone (twenty-four pounds each), 480 pounds of cheese per cow, assumes its entire control and management, excepting the sale of cheese, which is reserved to the farmer himself. The boore having paid the stipulated rent receives for his labour the entire products of the dairy, including swine. The farmer furnishes everything necessary to carry on the business, the boore being responsible for nothing but the work. There being no factory system in the country, each boore or farmer makes up his own milk. In the counties of Ayr, Dumfries and Argyle, where the dairies are small, the factory system would doubtless prove advantageous ; but in the other counties, where the dairies are quite large, I am not so certain. However, let the result be what it might, I doubt about the factory system ever obtaining a foothold in that country, owing to a thoroughly deep-seated prejudice in the mind of each individual in favour of his own dairy, every man knowing

of a surety that his dairy produces better milk than his neighbour's. It seems impossible to make them understand that the market is always willing to pay something for the uniformity engendered by the factory system, for the character and quality which a single intelligence educated to the business is able to give to the produce of whole neighbourhoods, that there is a great saving of expense in allowing two or three to perform the labour of fifty; nor can they by any argument be induced to see that these considerations in any manner compensate for the fancied superiority of every man above his neighbour.

I ask your indulgence now, gentlemen, for a little while, and I will close this paper with a brief history of my exploits in the land "o' cakes," and you will pardon me, gentlemen, if, in doing so, I make a somewhat frequent use of the pronoun "I," as I am quite solicitous that in giving an idea of what is going on in the cheese-making world of Scotland, and my connection with it, nothing of egotism shall appear in what I have to say. I should have omitted altogether to say anything of myself here to-day had I not believed you would be interested in comparing my recent "Apostleship" to the Gentiles with my former experience among you with whom I began first to preach and to teach.

With the considerations, correspondence, and the many, to you unimportant, circumstances that induced me to revisit the land of my birth I will not take up your time, suffice it to say that a word spoken by a friend in my favour in that far-off land was the means of procuring for me from a gentleman well up in the cheese interest there, an invitation to come over and assist him in his creamery. Having had for many years a desire to revisit the home of my childhood I embraced the opportunity, and on the 23rd day of February last embarked on the steamship *Devonia*, and was soon well out upon the stormy Atlantic. A pleasant passage of eleven days, and at the hour of 7 p.m., March 5th, our good ship laid her side against the pier in Glasgow, my native city. A hand shake all round, and a heart-felt good-bye to the officers and passengers with whom I had shared the dangers and enjoyed the pleasures of our long voyage, and turning, I found at my side a gentleman who inquired my name and said he had been sent to escort me to the residence of my friend. As I walked along the gang plank, and my foot touched the pier, that peculiar but indescribable sensation which is sure to thrill the heart of every genuine lover of his country, who, after an absence of long years returns, arose within me and instinctively the words—

> "Breathes there a man with soul so dead,
> Who never to himself hath said:
> 'This is my own, my native land.'
> Whose heart hath ne'er within him burned
> As home his footsteps he hath turned
> From wandering on a foreign strand,"

came to my mind, and when afterwards in Edinburgh I stood before the magnificent granite pile erected to the memory of the great man who penned them, I repeated them again with something of the patriotism and pride which every son of Scotland has a right to feel.

After a few days spent in the society of a brother and a sister from whom I had been separated nearly fifty-two years, I began my labours at the Dunragit Creamery, the only one in the country at that time in operation. This institution is conducted on principles somewhat different from our factory system; the proprietors, a limited stock company, purchasing their milk on contract at a given price per gallon, ten pounds and a quarter answering to that amount. At the time I arrived there they were receiving from thirty to forty-four thousand pounds per day of milk, fair as to quality but having a disagreeable flavour traceable to turnip and cotton-cake feeding. The methods of receiving, weighing and testing were similar to our own, but beyond this the general features of the factory were peculiar to itself.

From the weigh can the milk passes into a number of receiving vats from which, as required, it is drawn down one story into three centrifugal machines which separate the cream, and from whence the cream is forced through a pipe into a vat near at hand and the milk through another pipe into another vat close by. The cream is kept until such time as it is deemed sufficiently matured and then churned, but the milk is immediately drawn down another story into the cheese vats. These vats, or two of them at least, were

constructed upon a principle somewhat different from ours, the difference consisting solely in the application of heat instead of a coil of steam pipe under the milk, a large can of a capacity of forty gallons located at one end of each vat was filled, and then heat, by means of a steam pipe, extended into it, the steam passing from the pipe immediately into the milk. When the milk in this can was raised to a high but indefinite temperature it was dipt with a pail back into the vat from whence it had been taken, and thus by repeated heatings in the can the milk in the vat was raised to a temperature which was supposed to be proper for the application of the rennet which was universally Hanson's extract. Coagulation and cutting complete, and the second heating was effected by dipping the whey from off the curd into the can already mentioned, and the application of steam as before. The whey heated to about 140 degrees was returned to the curd, and thus the process was carried on until the curd was ready for the press; the other general features of their method of making cheese not varying materially from our own.

It will be seen from this description that the method employed was of a crude and very objectionable character, the introduction of the hot scorching steam into the milk itself, and the slow, laborious and very unsatisfactory process of heating, making the road to success exceedingly difficult, not to say impossible.

After spending about a month in this creamery I effected an agreement with the Scottish Dairy Association of which I have already spoken, by which I undertook for a stipulated time to give instructions to the dairymen throughout the counties of Wigton, Argyle, Kircudbright, Dumfries and Ayrshire, and immediately entered upon the discharge of my duties.

In order that the greatest advantage possible might be derived from my instruction, the Association planned for me a route which distributed the benefits as evenly as might be over the territory in the counties named. Having, as we have said, no factory system, it was necessary of course to reach as many private dairies as possible. Accordingly those having the matter in charge gave notice each week through the papers of the farms at which I would give instructions upon given days, and thus it transpired that upon every working day I was met at a given place by a company of cheese-makers from the surrounding country, who came to watch my movements, ask questions and listen to my instructions. The number of people whom I thus met daily ran from twenty to ninety-four, of whom a majority were women. Many came long distances to hear what I had to say, and a lively interest, I observed, was manifested everywhere. My pupils were generally intelligent, and a sharp fire of questions was usually kept up through the whole process. At certain points it was usual for my audience to agree that I had spoiled the curd, and later on to unite in manifestations of astonishment when they found I had not. "Had this been our curd," they would say, "we would have considered it ruined long ago," and again still later I was generally rewarded by an unanimous verdict of the company that the curd was the best they had ever seen. The point at which exceptions were usually taken was, first, at my method of ripening my materials, as I abstained altogether from the practice commonly followed by them of introducing sour whey for the purpose of advancing the work. Secondly, when the whey was drawn an animated discussion usually took place in which it was contended on the one side that it was not sour enough, and on the other that it was already too sour. The ministry (your humble servant) in the meantime being without a party in the house and *altogether* unpopular. Thirdly, I milled too soon. This resolution was generally unanimously adopted. Fourthly, in salting there was usually a divided house on the question of time, and a unanimous vote against me on the question of quantity, everybody knowing of a surety that I had used too much. This method of instruction afforded me a constant source of amusement, and furnished an instructive commentry on the system of every man his own cheese-maker, inasmuch as I was able to calculate that in a company of say fifty individuals there would have been at least fifty varieties of cheese produced, could each individual have his own way.

In going about from farm to farm I found great diversity in the character of the dairy tools and appliances, but there were some features common to all. Instead of the rectangular vat used in this country, a tub, sometimes of wood and sometimes of tin, from four to seven feet in diameter by about thirty inches in depth, was universally in use. The tin tubs were sometimes heated by the application of steam to their bottom, but more fre-

quently, indeed in seven cases out of ten, the heating was performed by pouring in the milk or whey, as we have already described. The presses were of a variety peculiar to that country, at least I never saw presses just like them in use anywhere else. They combine both the screw and lever power, the screw being used more particularly for the purpose of adjustment. Two presses were commonly included in one frame in which sometimes four cheese might be pressed. They were very handy and did their work satisfactorily, but I think, upon the whole, I prefer our common screw press. A sink with a false slat bottom, and a strainer cloth, a utensil with which most of you are familiar, and which I regard as indispensable to the cheese-maker, I was unable to find in all Scotland, but wherever I went I caused them to be constructed. Curd knives, perpendicular and horizontal, of the handy and accurate sort used in this country, were conspicuous for their absence. Imagine a frame half round on one side and straight on the other, three feet long and two feet wide in the widest part, and filled in with strips of tin about one inch wide standing edgewise and crossing each other at right angles, forming squares of about an inch, with a handle arising from the centre three feet long, and you have formed a good idea of one species of the Scotch curd knife. This implement placed upon the surface of the curd with the circular side conforming to the bend of the tub and pressed downward with one motion of the hand, but you will see a large portion at once, and this movement repeated three or four times, and one part of the cutting was considered complete. Another instrument often used in reducing the curd was a shovel-shaped affair, the blade part being composod sometimes of wire, somewhat resembling a three-tyned fork, the tynes being traversed at regular intervals of perhaps one inch by bars of steel, tin or wire. Strange as it may seem, the simple contrivance known to us as a dipper was a stranger in the land. There may be those here who have never seen a luggy, and for the benefit of them I will attempt a description of one. It weighs about ten lbs. and is made of tin or oak.

When of oak, they resemble a medium sized sap bucket with one stave standing up six inches higher than the rest and shaped for a handle. Its hoops, either of brass or iron, are always kept well polished. The tin ones are substantially the same in form, but whether of wood or tin they are always kept scrupulously clean. We venture to say that not one American in ten thousand who had not seen the luggy in operation would imagine its use. It is the Scotch milking pail. From the luggy the milk is emptied into the can, an institution about which I have my opinion. It is at least three times heavier than it ought to be, eighteen inches deep by a foot in diameter, having a bail of half-inch round iron, and weighs about twenty pounds. They occupy a position on the floor behind the cows, from which, when full, they are carried in the hands through the long byres to the cheese-room, a feat requiring no small outlay of physical strength. As a means of shortening the average of human life in Scotland, in my opinion they rank well with a pestilence.

I pass now to Scotch *modus operandi* of making cheese, with which I propose to close this already lengthy paper. I remark generally, in the first place, that there is a universal lack of a knowledge of what may be called the philosophy of cheese-making; the whys and wherefores of the business seem never to have been investigated. Causes were known to produce certain effects, and those were treated arbitrarily and with no consideration for a thousand external and internal influences and circumstances necessary to be understood in shaping one's course from the beginning to the end of the work. To illustrate: Rennet was known to produce coagulation, but its office and influence beyond this simple result was not understood and, consequently, in the estimation of quantity no thought was bestowed upon what was to be effected in the keeping quality of the article to be produced. The fact that a large quantity would produce decomposition and decay in the cheese sooner than a small one was not considered, and the additional fact that salt might be so used as to regulate in a measure the power and influence of the rennet, I found was still among the mysteries of the business.

With reference to milking, and the custody of the milk, I have nothing censorious to offer, saving perhaps the one observation that in many instances I found the byre, the midden, and the milk and cheese-room in much too close proximity, no suspicion of harm from the odours arising from the former seemed to exist. Farther than this, however,

I must say that neatness of the most scrupulous and painstaking character universally characterized Scotch dairies.

The milk was kept over night often in clay coolers six inches deep by four feet long and two feet wide, and being exempt from some of the maturing causes incident to our factory system, was, I found, as a rule, much slower in coming to maturity than with us, and it was at this point that a want of intelligent action on the part of the operator became apparent. That milk must undergo a certain natural change before the step could be taken he knew well enough, but how to hasten this change in a natural and healthful manner he did not seem to comprehend, but resorted to the practice of introducing sour whey, as we have already described, and so brought forward to embarrass his efforts and taint their results, the same mistakes and shortcomings with which he had to contend the day before. By so doing it will be seen that no day's mess was made up on its own merits, but was inoculated with all the diseases and faults accummulated from the indefinite past.

Upon the subject of rennet and coagulation we have already made some observations, and we have also described, with some particularity, the instruments used in cutting. I will now speak of the utility of these instruments and the Scotch method of reducing the curd. The first instrument described, which was used for the purpose of perpendicular cutting, performed its work in a very unsatisfactory manner. To pass it from the surface downward through thirty inches of curd was easy enough, but to withdraw it through exactly the space made in its descent was another and quite a different thing. Invariably in doing so thin shavings were cut away, and thus much irregularity was produced. Here, again, the operator exhibited his ignorance of cheese philosophy, not seeming to understand the benefits arising from uniformity in the size of his molecules. Having cut perpendicularly the balance of the work was performed with a very little regard to system or results. Sometimes the operator broke with the hands, but, more frequently recourse was had to the second instrument we have described, with which he proceeded to slash irregularly, and at haphazard, until he had reduced the mass to particles not larger than clover seed. Fine cutting, sometimes is necessary in order that a superabundance of moisture may be the more readily removed, but in dairies fed on high and up-lying pastuers it is apt to result in hard, dry cheese, a fault as much to be deprecated as any other.

While scalding, the operator expended a deal of useless labour in stirring, indeed, from the moment when the heat was applied until the curd was cooked, a time varying in length from an hour and a half to two hours, he never left off. What his purpose was, I was never able to determine, but I saw from the look of astonishment which appeared on his face when he saw me accomplish better results with half the labour, that he evidently had supposed it productive of something good. To conclude this laborious performance he gave the contents of the tub a whirling motion which naturally caused the curd to accumulate in a conical shaped heap in the centre, when the faucet is opened and the whey drawn off. The convex surface of the bottom facilitates drainage, which process is allowed to go on until the curd has become a solid mass. It is then cut and turned over without stirring, and when drained to the satisfaction of the maker is removed to the cooler, and subsequently ground, cooled, and salted. This method of draining you will see is very imperfect, not at all comparing with that which takes place when the sink we have mentioned is used, and, as a result, too *much acid* is developed which remains to play a *mischievous* part in the subsequent history of the product.

The cheese are pressed, not in the bandage as with us but in a cloth as we were wont to do in time long since gone by. In form they are generally fifteen inches in diameter by twelve inches deep, but we have seen many that were seventeen inches deep by twelve in diameter, and which weighed from 120 to 135 lbs. Three days are employed in pressing, during which time they are frequently taken out, the cloth removed and a new one supplied. For the purpose of securing a rind, the first time they are taken out they are dipped in warm water, and the last time smooth cloths are applied to the top and bottom, but a bandage such as we use is never employed. When the cheese are ready for the shelves they are bandaged in a manner exactly like that employed by a surgeon upon a broken limb. A cloth about four inches wide is taken in the hand and carried around

the cheese spirally from bottom to top, the end held by a lap and the last by pinning or sewing.

The Scotch have perfected an idea for shelving and trimming cheese worthy of imitation inthis or any other country. A line of posts stand, say. six or eight feet apart across the curing room between which a form of four shelves supporting sixteen cheese is supported by gudgeons resting in bearings in the posts, so adjusted that the whole form will revolve. The backside is traversed by bars, so that when the form is turned from a perpendicular to a horizontal position the cheese will not fall out. The space between the shelves is but little wider than the height of the cheese. With this arrangement, a half revolution of the form, accomplished by the simple raising of a latch and a single movement of the hand, turns sixteen cheese. Aye it does *more than that*, for those cheese which before were at the top are now at the bottom, and thus the irregularity of temperature always existing in the curing room is provided against.

Another undiscovered fact to the Scotch maker in cheese philosophy is the influence of temperature in the process of curing. That in every healthy cheese there is a sort of chemical life or activity always going forward, as necessary to its normal existence as the circulation of the blood is to the human body, which chemical life flourishes best under particular atmospheric conditions, is a fact upon which the dairymen of Scotland as well as America need to be read an impressive lecture. Their appliances for heating I noticed were of a strangely diversified and incompetent character. When boilers were in use, steam was generally employed and was distributed by means of iron pipes four inches in diameter sometimes laid along the floor and sometimes attached to the walls of the department. This arrangement worked well enough when in operation, but in every case within my knowledge its benefits were lost by permitting the fires to go down as soon as the day's work was done. All the other methods employed, from the small and altogether inadequate coke burner up to the more imposing, but not more efficacious fire-place, coupled with the irregular manner in which the fires were kept up, proved how little the maker appreciated the value of a warm and even temperature in maturing and perfecting his product.

Marketing.

Marketing with them is not the systematic and orderly arrangement established in this country, with its salesman and boards of trade, but is altogether a game of haphazard, buyer and seller meeting as chance decrees. Sometimes parties wishing to speculate go about from farm to farm, examine and purchase, and sometime the dairyman goes to the nearest town on market day in search of a purchaser, but always in the transaction I was pleased to observe a degree of confidence existing between the parties—rarely to be met with on our side of the Atlantic. The cheese are weighed in lots of from five to ten, and the actual weight of each draft is set down until the weight of the entire sale is ascertained, there being no practice like that which we have of weighing each cheese by itself. It would frighten an American to see a Scotchman deliver his cheese. At any rate, were any dairyman in this audience, after having perfected a sale of his cheese, to load them into his waggon, without bandage or boxes, standing them on their edges, packed in straw,we venture to say his neighbours would think him a fit candidate for a mad-house, and yet such is the practice in Scotland.

Discussion on Mr. Harris' Paper.

Mr. Mills.—Would you regard ensilage of all kinds as injurious to milk?

Mr. Harris.—I would, if it is acidified. If it is very sour it is not fit to make cheese out of, or butter either.

Mr. Mills.—Cannot it be made fit to make butter or cheese?

Mr. Harris.—I do not think it can.

Mr. Richardson.—Do they feed turnips twice a day in Scotland?

Mr. Harris.—They do.

Mr. MORRISON.—Do you consider their method of shelving cheese preferable to our way here?

Mr. HARRIS —Yes, sir.

Mr. MORRISON.—Could it be made available here?

Mr. HARRIS.—Yes, very easily. You could turn sixteen cheese with one hand.

Mr. MILLS.—What age do you consider the best at which to begin milking cows? Do you approve of the Scotch three years?

Mr. HARRIS.—I prefer two years old, myself.

Mr. MILLS.—I presume the Scotch have some good reason for three years' old?

Mr. HARRIS.—Well, they get larger. They think they are too small when they are two years' old. I talked to some of the farmers there about it, and they said they would try my plan of having them come in when two years' old.

The Convention then adjourned at 4.45 p.m.

SECOND DAY—EVENING SESSION.

JANUARY 15TH, 1885.

The PRESIDENT took the Chair at 7.30 p.m., and introduced the new President, Thomas Ballantyne, M.P.P., for the ensueing year.

Mr. RICHARDSON said that Mr. Ballantyne has done as much, if not more, than any other man in the Dominion to stimulate the cheese industry and to educate the people to keep the milk right and to make good cheese. He said he had always got good information from him when driving him around. The greatest trouble in the Western district is the taking of the whey home. He had been talking to Mr. Ballantyne to-day, and he was telling him the prices that he got for his cheese where they did not take the whey back, and no doubt the farmers are standing in their own light in still adhering to this thing. In my neighbourhood we are only drawing milk once a day, and I think I was the first in Canada who commenced doing that. I find where we are drawing the whey back the only thing to do is to have a man going around amongst the farmers all the time. You are well aware that the high standard of our Canadian cheese this year is second to none in the world—a very few English cheese better. I think we have now got ahead of our American friends; in fact, our prices have been higher all the season, except in the early part of it, several cents a pound higher.

Mr BALLANTYNE now came forward and was received with applause. He said:

Members of the Canadian Dairymen's Association:

I have to thank you for this repeated expression of your kindness and confidence in electing me to this position. I do not know how many times I have been elected. I have filled this position a great many years during the existence of this association, but there are others that I consider better entitled to it than I am. I was almost unwilling to accept of it, but the Nominating Committee are desirous I should accept of it. I can only promise to do in the future, as I have done in the past, and I charge myself of never doing or saying anything that was not for the interest of Canadian dairymen. I have contributed my mite in trying to improve our Canadian product, and the high price we are now getting is the result of this association, these Conventions and other means in use, and it is no small compliment that our goods have such a good name. There have been several papers read on cheesemaking, and, as the great majority of these present are cheesemakers, it would probably be best to dispose of all the papers on that subject, and then allow a discussion to take place on everything relating to all of them.

The Secretary has just told me that the Corporation of the Town of Stratford are desirous of presenting an address of welcome here, and the time named was 7.30. If some of you near the door will tell them that the meeting is now open, you will oblige me; and those of you in the back of the hall will please take seats in front. I hope the meeting will be sufficiently interesting to keep you all to the end.

As the Board of Trade have not yet presented themselves, I do not suppose it will put any to any inconvenience if we have Mr. Gilbert's paper now before the Board of Trade present their address. I will now introduce to you Mr. Gilbert, who has aided so materially to the success of the dairying interest. He is the Agricultural Editor of the Utica *Herald*, which is recognized as a dairy authority all over this country and even in England. Those of us who have been connected with dairying for the last twenty years will remember it was the Utica *Herald* we looked to for our authority. It has patrons amongst the farmers irrespective of politics. I find those who differ the strongest with him politically are all taking the *Herald*. He is also Secretary of the Utica Board of Trade. The report of their market, we look for eagerly every Tuesday morning in our daily papers.

Just at this juncture the Mayor of Stratford came in and proceeded to the platform —on invitation of the President—followed by the Town Council in mass. He shook hands with Mr. Ballantyne, who introduced him to the audience, when he was greeted with cheers. He spoke as follows:—

Mr. Ballantyne and Gentlemen of the Western Dairymen's Association of Ontario:

As Mayor of the Town of Stratford, it affords me much pleasure on behalf of the corporation and citizens generally, to extend to your honourable body a right hearty welcome on this the occasion of the holding of your annual convention for a second time in our town. And, in extending to you and all a warm and generous welcome, I but speak the genuine and earnest sentiment of the entire community as a whole.

The industry, whose interests you have met here to foster and develop, is one that has made marvellous strides of advancement during the last few years. I am, comparatively speaking, but a young man, yet I can well remember when there was not a single cheese exported from one end of the Dominion to the other, and to-day there is exported annually an amount aggregating several millions of dollars; to my mind it is one of the most valuable products of our country; especially is it so in the Provinces of Ontario and Quebec, where the soil, the water, and the climate have proved themselves so admirably adapted for dairy farming. It was a great gratification to me to see reported from an Old Country paper the other day, an account of a cheese fair recently held in Scotland, that the products of Canada had carried off 75 per cent. of the prizes awarded.

The industry has become a source of great wealth to the farmer, not only in the profits derived directly from the manufacture of cheese and butter, but by the enriching and regeneration of his farm, many of which but for these products, would have by this time, from the constant growing of grain, become worn out and worthless, but are now numbered amongst the most valuable in the Province, and should there become at any time a glut or depression in the cheese market, causing prices to fall below the point at which it would be a loss to manufacture the article, they can at once turn their attention to other branches of agriculture, as under the dairy system their farms are always in perfect readiness for the change.

It was highly pleasing to me, on the occasion of my visit to your meeting this morning, to see so many young men in the audience, who all appeared to manifest the deepest interest in all the proceedings of your Convention. It speaks well for the character and intelligence of the young and rising generation, and to my mind is a perfect guarantee that the future prosperity and development of the industry is assured.

I am sorry of a false impression that has got abroad among some of your members, how I know not, and am glad of this opportunity to correct it, to the effect that the use of this hall for the holding of your present Convention was only granted by the Council on a narrow majority. This, gentlemen, I am happy to say, is entirely incorrect; the moment your Secretary's letter applying for the use of the hall was read (notwithstanding

it having been previously engaged by other parties) a resolution was immediately moved and unanimously passed, instructing the Chairman of the Market Committee to procure for you another hall providing the previous engagement could not be cancelled, and the Clerk instructed to forthwith write your Secretary and say that your request was unanimously granted. I trust that no misapprehension on this point will obtain, for I can assure you the Council with myself were only too glad to have the opportunity of granting your request.

In conclusion, gentlemen, I have only to say again that we are heartily glad to have you all amongst us on this occasion, and trust that your present sojourn will be so comfortable and pleasant in every particular, and that you will find our position in every way so convenient and central, that you will make Stratford, if not your permanent seat of government, frequently the place of holding your annual Convention.

Mr. BALLANTYNE—

Mr. Mayor and Gentlemen of the Council of the Town of Stratford:

In behalf of the Dairymen's Association of Western Ontario I have to thank you for the kindly address of welcome which you have presented, and for the kindly manner in which you referred to the Association. You have referred to the great progress that dairying has made. It is only those who have been connected with it from its introduction who know the many difficulties that have been surmounted and the bright opportunities that it now holds. You have referred to Kilmarnock Show, in Scotland, where prizes were obtained on the cheese made in Canada. We were, in many respects, following the example they set us. It was made by the same system they pursued, but our factory system has resulted in an amount of opportunities for intelligent comparison and observation which has suggested many improvements, and the result is that a gentleman here was selected to go to Scotland for the purpose of learning their best methods of cheese-making, and he has discharged his duties in a most satisfactory manner. He was here to-day and read a paper on dairying in that country. I would only now say that the matter in connection with the hall to which his worship referred, I do not suppose that any person outside has heard anything about it, and that it existed only in their minds. I believe it was the wish of the Council to give us all the assistance they could. I think everybody here is delighted with Stratford, with the hotel accommodation, and all things in connection with this gathering. Again, Mr. Mayor and Members of the Town Council of Stratford, I have to thank you on behalf of this Association for your kind address of welcome.

Mr. CHADWICK.—As Secretary to this Association, Mr. Mayor, I might add, with regard to the difficulty about the hall, that it is the first thing I have heard about it. I communicated—by the instruction of the Board of Directors—with you, and received your reply at once granting the use of the hall, and this is the first intimation I have had that any difficulty was in the way, and I am quite certain that it was your intention to receive us in the same courteous way that you did on the last occasion of our meeting here, and we certainly appreciate this act of yours as a mark of respect and esteem on your part toward this Association, giving this public address of welcome to the convention. I believe, during the eighteen years of its existence, that this is the first time that a municipal body has given a public acknowledgment of the worth of this Association, which goes to show that the importance of this Convention is forcing its way upon the minds of the people. An address of welcome of this kind must give weight to the influence and add to the interest and benefit that this organization is conferring upon the community at large, and I, as the humble secretary of this Association, wish to communicate to you my hearty thanks for this courteous reception.

Mr. BALLANTYNE.—I had just introduced Mr. Gilbert, of Utica, and I do not now think it is necessary to say anything in addition to what I have already said.

Mr. Gilbert then read, as a preface to his paper, the following:

It used to be said of Mr. Gladstone several years ago, before he had reached his present advanced age, that he was a famous feller of trees, and that when, during a recess

of parliament, he returned to his home manor of Hawarden he worked off his surplus energy by stripping off his coat and chopping down some of the great trees on his estate, just as he had lowered the heads of his rivals in debate in the House. This story has always seemed to me somewhat apocryphal, as I never heard of an Englishman yet who would not prefer to set out two trees rather than to cut down one. But, all the same, the anecdote is typical of the energy and perseverance which characterize not only Mr. Gladstone, but the entire English race. This earnestness and perseverance they carry into whatever occupation they undertake. In politics Mr. Gladstone and Mr. Bright are the very incarnation of these qualities. In practical and applied science, Sir Henry Bessemer, the inventor of the Bessemer steel process, Sir William Siemens, the great electrician of the age, and Sir Joseph Whitworth, whose guns and projectiles have wrought a revolution in the art of war, have largely helped to make the latter half of the nineteenth century the most remarkable epoch in history. And what persevering workers have been the English literary men of modern days. Anthony Trollope boasts in his autobiography that he has not had above two consecutive days vacation in twenty years; Charles Reade spent weeks and even months in the study of a particular period or some special social wrong before he would venture to write a work of fiction illustrative of it; James Payn and Edmund Yates, who have recently published memoirs of themselves, show how earnestly and steadfastly they have worked on their literary productions. In commerce, in manufactures, in ship-building, in mining, in fact in all the active departments of English life, the same industry and perseverance are to be seen, commanding the respect of other nations and achieving the success which is their rightful due.

THE DAIRY BUSINESS IN NEW YORK AND CANADA.

By E. D. Gilbert.

Among the more unpretending occupations that the British have followed up with great pertinacity, in spite of tremendous competition from this side of the water during the last ten or fifteen years, is the business that you are met here to discuss, viz., dairying.

For a long period of years this was one of the chief sources of prosperity to the English farmer. Then came the time when American cheese and Holland and Normandy butter began to compete with the native articles for the markets of Great Britain. Under these influences the dairy interest declined, and the cheese and butter-makers felt gloomy as they looked into the future. For a few years it looked as if they were to be driven to the wall. But after they had come to appreciate the situation fully, their British pluck came to their aid. The wealthy men of the land formed mammoth dairy associations, which hold their yearly meetings for the exhibition of live stock and dairy products. Eminent specialists like Dr. Vœlcker and Professor Sheldon were brought to the front, and induced to enter heartily into the work of improving methods and cheapening means. Other prominent men like Lord Vernon and Canon Bagot lent their assistance by way of encouragement, and travelling dairy schools were formed to visit different parts of the country and furnish free instruction in the latest and most approved methods of manufacture. The result of these efforts has already been seen in a considerable increase in the make of butter and cheese. Previous to this the milk business for towns had begun to be overdone. Recently it has been reduced in volume and the milk has again been turned into the vat and the churn. Cheese makers are learning to produce a quick curing cheese in the spring, to put upon the market and rival the fresh spring arrivals from America. The fact is, the gentlemen who have roused themselves to take an active interest in this matter, have endeavoured to make the English dairymen feel that it is a disgrace for the country to spend millions of dollars annually for commodities, a portion of which at least they can unquestionably produce themselves. The effect has been seen during the past season in a somewhat smaller importation of foreign cheese, although the American continent has not suffered from it; while the butter markets of both the United States and Canada having been visibly affected by it for three years past. It is the old story of the

Englishman's pluck; he doesn't know when he is beaten; and by virtue of his energy and perseverance he goes right on and converts his former defeat into a success and a genuine gain.

But I am to speak to you of the present aspect of the dairy business, and we will first turn our attention to

CHEESE.

The exports of cheese from the American continent for the period extending from May 1 to December 1, 1884, were 160,272,275 lbs. Of this amount 85,271,076 lbs., or 53¼ per cent. of the whole went from the port of New York. The Montreal shipments were 68,379,550 lbs., or 42½ per cent. of the whole, or a little over 1,100,000 boxes. The remaining 4¼ per cent. went from Boston, New Orleans, Baltimore and Philadelphia. For the same seven months in 1883 New York shipped only 82,753,847 lbs., or 2,517,229 lbs. less than this year, which is equivalent to 41,953 boxes. The receipts in New York this year for the same period were 2,024,914 boxes, and for the corresponding period in 1883 they were 2,097,692 boxes, showing a decrease of 72,778 boxes. Adding the increase of exports to the decrease of receipts, we should naturally suppose that the market was better off by 114,731 boxes. The comparison with 1882 is still more striking so far as the exports are concerned. That year the shipments from May 1 to December 1 were only 71,288,343 lbs., or 13,982,733 lbs. less than this year. This is equal to 233,045 boxes less than the exports of this year. The fact is that, with the exception of 1882, the receipts have been smaller than for the corresponding period in eight years, while, as I have shown, the shipments are larger than during the two years just past. What ground is there then for the complaint of dullness in trade, which is so prevalent among merchants engaged in the business?

Ever since July 1st there has been the complaint that cheese was being put into cold storage in New York city. When account was taken of the stock of cheese on hand October 1st, there was reported to be 66,193 boxes, against 47,586 at the same time last year. But it was claimed that this report was entirely inadequate, and that there were at least 100,000 boxes in stock. Where could this all come from? With five per cent. less cheese to handle on account of increased shipments and decreased receipts, it seems almost mysterious that there should be such a surplus on hand. I can see but one explanation for it. Slackness in the home trade must be responsible for this accumulation of stock. There are two reasons for this diminution of our domestic trade. First, the make of cheese in this country has not been as good in quality as usual. The excessively hot weather of a part of June, August, and September, and the alternations between heat and cold, made it very difficult to secure the right conditions for making a perfect cheese, or for curing it when made. This imperfect stock was the first to go into cold storage, as it was rejected by shippers and let alone by home buyers. Having been bought at comparatively low prices, from 8½c. to 9½c., it was believed that, by storing, it might be brought forward later in the season and sold at a profit on the advance in September cheese. The accumulation thus begun was added to from time to time, domestic buyers keeping just as shy of it as shippers. But there was another cause which came into operation later on, and that cause was skimming.

A year ago I had the pleasure of saying to the members of this association that the cheesemakers of New York state were not jealous of the rivalship of their Canadian brethren, and that there was room for all the fine cheese that could be made on both sides of the line, at prices that would pay for the making of it. And I still reiterate both opinions. It is with no feeling of jealousy that our cheesemakers, who form the most intelligent body of men among our farming community, acknowledge that they have been beaten by you during the season just passed. It is rather with a feeling of regret and possibly of indignation that they have been placed at such a disadvantage by the necessities of their position. If the factorymen could have their way there would be no skimming, either light or heavy. But the patrons have forced them into allowing it, and during the past season they have skimmed not only in the spring but much earlier than ever before in the fall. Thus our factorymen stood between two fires; at home there were the patrons robbing the milk of its richness early and late; while over here you were outdoing them

with a strictly honest production which made the patrons of our factories grumble because they could not get as much money for their cheese as you did for yours. You can see that it has been a trying position for our factorymen, who were in nine cases out of ten perfectly aware of the cause of the difference, but also perfectly helpless to remedy it. And so strong has the feeling become on the part of our cheesemakers that a powerful influence will be brought to bear against skimming in the season that is to come.

Butter.

Butter stands on a different basis from cheese in this country, and is practically independent of foreign trade. According to the census of 1880, the amount of butter made in the United States that year was 806,637,381 lbs, while the exports were only 37,422,479 lbs., or 4½ per cent. of our total production. Since that period our manufacture of butter has materially increased, and the exports have largely decreased—probably one half. During the year 1884, we exported 15,813,887 lbs, where we sent out, the year before, 18,760,138 lbs. Thus, our exports of butter are falling away year by year, owing partly to the fact that the people of the United States are willing to pay a higher price for it than any other country. The probability is that our exports of butter last year did not equal more than two per cent. of our entire product. It is a curious coincidence, but a very natural one when we stop for a moment to consider, that the course of the butter trade in Canada has been precisely similar to our own. In the year 1880, Canada exported 18,887,000 lbs. of butter; in 1881 she sent out only 17,820,000 lbs.; in 1882 the exports had fallen to 15,338,000 lbs.; while in 1883 they were only 8,106,000 lbs. Her experience is almost a duplicate of our own, excepting that her transactions were at no time so large as ours. Now, it has been claimed that the sale of oleomargarine is responsible for the loss of our exports in butter. But if this be so, how can we account for the similar shrinkage of Canadian butter shipments? So far as I know, there are no oleomargarine manufactories in Canada, nor was a pound of it ever shipped from her ports. And yet we find her losing her trade at the same time and in about the same ratio that we have lost ours. The truth seems to be that the causes of this loss exist on the other side of the water instead of this side. In the first place, England has been learning that she can get fine butter cheaper in Holland or Normandy than she can in this country, while the longer sea voyage it has to take going from our shores is a considerable detriment to its quality. And in the second place, the new dairy schools that have sprung up in England and Ireland, have awakened fresh interest in dairy matters, and a larger amount of butter is being made by their own people than ever before.

As the matter stands at present, therefore, it is necessary that our buttermakers should find a market for their product at home, and this compels them to be governed by the universal law of supply and demand. An examination of the past season's trade shows that prices have taken the following course: Starting last spring in the country at 27@28c., butter soon sold off to 25c., then to 23c and 22c., in June to 20c., and for a couple of weeks in July to 19c. But it soon rallied to 22c., and by September had risen to 25c. In October, farm dairy butter sold at 27c., and it held at 25c. to 26c. until December 1st, when it fell to 23c. and then to 20c., the quality having become quite inferior. Meanwhile, extra Elgin brands were selling in New York at 29c.@30c., and the best fall-made state butter at 25c.@26c. But the prices I have quoted are those which the dairymen themselves received for their butter. Probably butter at 20c. no more than pays its cost, but very little has been sold for that this season, and the average price will not come far from 25c. That is a paying price, altho' the dairyman is not likely to get fabulously rich out of it. Like everything else it must have its poor years as well as its good ones, and like everything else, this year in particular, it is lower than for a series of years past. There has been some improvement during the past month, but it was chiefly on the best grades.

The Production of Milk.

I propose to make a comparison between the produce of an English dairy county and that of an American dairy county. For twenty years past, County Derby in England

has taken the lead in dairying, particularly since the cheese factory system was introduced there. Let us compare this county with Oneida County in New York State. Derbyshire has an area of 1,030 square miles, with 511,603 acres under cultivation. The area of Oneida County is 1,215 square miles, with 541,628 acres of improved land. It will be seen that Oneida is 185 square miles the larger, and has 30,025 acres under cultivation more than Derbyshire. The total number of cattle in Oneida is only 98,648, while in Derby they number 135,182; but Oneida has 68,049 milch cows, and Derby only 65,672. It is evident, therefore, that the English county goes into the raising of beef cattle much more extensively than the American; but at the same time it has only 2,377 less milch cows, or three and a half per cent. less than Oneida, a very small matter as compared with the whole number. But look now at the difference in the milk yield of these two counties. Lord Vernon, one of the great landed proprietors of Derbyshire, and a man who is both deeply interested and thoroughly well informed in its dairy statistics, estimates that the average yield of milk per cow is 600 gallons a year, or something over 4,800 pounds, and he says that his calculation is estimated very low. Now, how does Oneida County compare with this? And you must remember that Oneida is one of the best grazing counties in the State, and probably gives as large a yield of milk per cow as any other county. Taking the figures of the last census, we find that our 68,049 cows gave 172,641,088 pounds of milk, or an average of 2,537 pounds per cow—not much over one half the amount that is obtained in County Derby. It is true that the census figures only take account of the milk sent to market and of the butter and cheese marketed. In addition to this there is the milk used in the dairymen's families both for drinking and cooking purposes, and for butter. I calculate that this would raise the average per cow to about 3,000 pounds a year. This would bring the total yield of Oneida County up to 204,147,000 pounds from her 68,049 cows; while Derby, with 2,377 fewer cows, gives 315,505,600 pounds. At the dairymen's usual estimate of the value of milk, viz., one cent per pound, the difference amounts to $1,113,586 a year, a sum by which Oneida would be the richer if her cows were to equal those of Derby in their yield. And the question very naturally arises, why should our milkers not come up to this standard? I can point you to dairies of twenty to thirty cows in which the average yield per cow is 5,000 pounds. And there is no good reason why the yield of all our dairies should not be brought up to the average estimate of Lord Vernon for the County Derby. Six hundred gallons per cow is far from being an unattainable figure. The working stock of English dairies ought not to be in any way superior to our own. By introducing a strain of good blood into the herd, and weeding out such animals as are known to be poor milkers, a vast difference could be made in the average yield within a single year. This subject has been harped upon by dairy writers until it has grown so threadbare that one is almost ashamed to mention it. And yet it is one of such vast importance that it must be agitated until the result has been brought about. I have introduced this comparison with an English county to freshen the discussion somewhat, and at the same time to show how far behind we are in the one most important requisite for making our dairies remunerative. At 600 gallons a year Lord Vernon calculates upon £2 17s. profit per cow, which in our currency is $14.25. But then he is estimating sevenpence per gallon for milk, which is one and three quarter cents instead of one cent a pound, a price which our dairymen cannot hope to attain. But we may hope to bring our average yield up to a much higher point; and as our population grows denser and larger numbers engage in the dairy business, the mere force of circumstances will compel our dairymen to improve their herds and increase their yields if they expect to gain a livelihood out of their calling. And those who are the earliest to adopt more progressive methods, will be the ones to reap the largest rewards.

The Dairy Outlook.

In speaking of the outlook for the coming year and for the future generally, it will be necessary to take into account the present situation. The visible stocks of cheese in the principal distributing centres of Great Britain and Amercia for the last three years on January 1st have been as follows:—In 1883, 697,487 boxes; in 1884, 670,315 boxes; and in 1885, 847,850 boxes. According to these figures, the stocks were about 20,000

boxes less last year than the year before, while this year they are 182,000 boxes more than last. More than one-half of this excess lies in Canada and Liverpool. The stocks of Canada for the three years mentioned were 40,000, 75,000 and 100,000 respectively, having more than doubled in two years. New York city has practically about the same stock as two years ago, but Liverpool has largely increased her stock, the figures for 1883 being 112,000 boxes, for 1884 115,500 boxes, and for 1885 195,200 boxes. The total increase of the supply this year over last is 177,535 boxes, or about one fifth. Of this amount Canada and Liverpool contain 59 per cent., or nearly three-fifths, the remaining two-fifths being divided up among the states. From such a showing as this it might naturally be inferred that the production of the past season has been one-fifth greater than it was in the previous year. But I do not apprehend this to be the case, and my reasons are as follows: Since the first of January, 1884, most of the necessaries of life have experienced a heavy decline. In breadstuffs this has amounted to 20 per cent.; in meats, about 25 per cent.; in tea, coffee, sugar and other imported food products, about 20 per cent.; in oil and coal, about 15 per cent.: but in dairy products, including cheese, butter and milk, the decline has been only about 5 per cent. In cheese alone the price has decreased even less than that, as is evidenced by the average price for the season on the Utica Board of Trade, which was only one-third of a cent less than last year. This would be a trifle over 3 per cent. decline on cheese. The probability is, therefore, that the sale of cheese to consumers has not been as extensive as it was in 1883, for the reason that other articles of food were so much cheaper in comparison. Hence the unwonted accumulation of stocks at the trade centres, the price of cheese being so nearly what it was a year ago, while the prices of other articles of food show such a marked decline. Of course the dairyman is to be congratulated on his prosperity as compared with that of other branches of business. But the question very naturally arises whether such a disproportion can continue another year or more! If this decline in manufactures, in iron, and in almost all classes of goods, should continue for another year, could dairy products resist the general tendency, and maintain the excellent prices they have brought during the past year? I am sorry to say that such a result is not probable. The present accumulation of stocks is a warning that the people will not buy cheese to the same extent, if they have to pay disproportionately high for it.

But, some one may ask, is it not possible that this surplus may arise from an increased make of cheese after all? Canada has shipped say 50,000 boxes more than last year and she now holds 25,000 boxes more than last year. I did not intend to deny that there has been some increase in the make, although I doubt if there has been much increase in the States. Probably ten per cent., or one half of the present surplus, is the result of increased production; the rest is the result of decreased consumption; and practically it makes no difference. The surplus is there, and it will be there in still greater force another year if the disproportion in prices should continue for that length of time. But I do not believe that it will continue. Careful and unprejudiced men who have studied the condition of business affairs for the past three years, declare that there ought to be an improvement during the present season. The exceedingly low prices for grain, together with the open winter and the prospect of damage to winter crops, have at length induced buyers to enter the market, and a substantial gain in values has been made within the last two weeks. Should this remain permanent, other articles of production will follow the lead of wheat; railway stocks will be stimulated by the increased carrying trade which will be developed by the improved prices of grain, and the general business of the country will also receive a benefit. It looks as if this might be the course of things during the coming year, and if it is, the prices of dairy goods will not need to be lowered. No other branch of the farmer's business has been so prosperous in the past year as that of the dairyman, and I trust that matters will so shape themselves that no other will be so prosperous in the year that is to come.

Mr. Ballantyne now introduced the question drawer, and said the meeting was now open for discussion on the papers that had been read. All will now have ample opportunity for discussion the remainder of this evening.

Mr. E. Caswell.—Do the stocks this year compare with what they were last year on the aggregate the 1st January?

Mr. GILBERT.—177,000 boxes more on the 1st of January in the distributing centres of the American Continent and Great Britain than there were last year; that is, one-fifth more than last year.

Mr. CASWELL.—How much is produced from a cow in Scotland in proportion to what is produced in Canada?

Mr. BALLANTYNE.—That matter is easily answered. In Scotland they run on an average of 480 lbs. for each cow, and for each heifer 360 lbs. The farmer finds the feed and milks the cows, as a rule, and the dairyman makes the cheese and has as his wages all he can produce over and above the amount stated; and, no doubt, we could nearly double our production. I think we have cows on the whole not inferior to theirs. They are better fed over there; they are not dependent on the pasture alone. I remember last spring they were all in the stables, and the average was about 32 lbs. of milk per cow. The cow is a mere machine for making feed into milk. I have been remarking this year that farmers did not need to complain, for I believe if they would grind their wheat and give it to their cows it would pay them better and give them back more than a dollar a bushel.

Mr. CRAIG.—The remarks of Mr. Gilbert appear to be very opportune. There is a certain amount of feeling and fear in the breasts of dairymen and the patrons of factories that a crisis, as regards cheese manufacture, is immediately to reach us. That by and by we will have a five and half or six cent season for our cheese as we had in 1878 or 1879, I forget which. (A voice in the audience.—1879).

Mr. BALLANTYNE.—1878 was the dealers' year.

Mr. CRAIG.—The remarks that he made that notwithstanding the decrease in price of the leading articles of human food, cheese has maintained, to a large extent, the position which it has had since 1880—for the last four years, anyway—is not this confirmatory to the experience of us all that cheese and butter will be used if bread is at a high figure. I think that the low price of the common necessaries of life does not make us look for a falling in the price of cheese. As a rule, I think if you turn back to the history of the dairying interest I think you will find that when the common food, the flour and other edibles which men cannot do without, is high, the price of cheese is depressed, but, on the other hand, when bread is low, they can afford to buy, and buy freely of those other things which make the bread swallow more freely. I therefore think we have no particular occasion to dread any great fall in our dairy products, either of cheese or butter. I have heard it said, and the Chairman will bear me out in this, that merchants and brokers in London, Liverpool and Glasgow have said: "If you can deliver cheese in these markets to be able to put them on the grocer's counter at sixteen cents here, in Canada, there will be no limit to the consumption of a good, fine article. There is no danger of supplying the English market with anything like an overplus. I have no doubt that the price of cheese will be at a remunerative figure and encourage the industry which we all have so much at heart. (Cheers.)

Mr. BALLANTYNE.—This question of over-production has come up, based on the trade centres of both England and America. There is nothing alarming in it. Nothing will diminish the production of cheese so much as poor quality. Get good cheese and you will get rid of it quickly. Get bad cheese and you will likely not get any one to eat it. What we want to do is, do everything we can to improve the quality. I am glad we have resisted the temptation to partially skim our milk. Some have shown me statistics to try and convince me that it would pay better to keep a part of them, but some of us stood out strongly against it. Let us produce good cheese from full cream and if we produce good quality and keep our reputation we will be able to have all the advantages that flow from it. Our cheese are now at a premium. Our western Ontario cheese are known to be full cream, and we hope you will continue doing it in this way. The cause of any excessive stock is, no doubt, the result of bad cheese. There is nothing that is apt to make makers more careless than having good success. In England they supposed the only time good cheese was made was in September. Sometimes in September we have had the worst kinds of weather.

To Mr. McAdam.—*First Question.*

1. Does it require more rennet to coagulate the milk when the temperature is low?
2. Will cheese cure more quickly when the milk is set at a low temperature?

Mr. McAdam.—Rennet acts more quickly on milk at a high temperature. I hardly think the cheese will cure more quickly. The paper I read was not written by me, and I do not endorse what it stated in that regard. I think it is a question of not much importance anyway.

Mr. Cleverdon.—We think it a question of paramount importance with us.

Mr. Ballantyne.—I would say, let them keep the curd until it is fit to use—not to have a porous cheese by any means. When in England, along with Mr. Caswell, we found a universal complaint against our early cheese. They did not want cheese to keep at that season of the year.

2nd Question.—What is the cause of what is known as a sloppy or soft curd?

Mr. Harris.—There can be many causes. Bad milk is one, and that is the only cause that I can think of.

Mr. Ballantyne.—How would you treat it when you find one of that character?

Mr. Harris.—I should scald it a little more than the common curd, and cut it a little finer, drain it thoroughly, and give it a little more salt, and stir it until it gets perfectly dry in the sink.

3rd Question.—Is there any one who will tell us the difference between cheese and butter in price?

Mr. Ballantyne.—That question is a very important one. The question of creameries is being very much discussed. The opinion arrived at at a farmers' meeting was that we can only make a quality fit for the market by the creamery system.

Mr. Barre.—With proper appliances for making it I believe butter will pay just as much as cheese. I have been making butter for the last three years and have obtained, on an average, for a whole year a pound of butter from 22½ pounds of milk. If you take into account the value of the skim milk properly fed to swine, and the price generally obtained for butter, you will find it will come up to nearly as much as the price obtained for cheese. I would not advocate butter making against cheese-making, but, if butter-making is properly attended to, it will certainly pay as much as cheese-making.

Mr. McPherson.—What is the price you obtained for butter this year?

Mr. Barre.—I am not in a position to state exactly the average price, but I think about 22 cents.

Mr. Moyer.—I realized 22½ cents for mine.

Mr. Barre.—I never sold for less than 22 cents.

Mr. Caswell.—In the lower Provinces have there not been more cheese factories started there this last season?

Mr. Barre.—Yes sir; more during the last two or three years.

Mr. Caswell.—And has there not been more cheese made than butter, then?

Mr. Barre.—Yes, but we must take into consideration this fact that the two industries seem to be increasing steadily, with a tendency in favour of cheese, but now they are going into a butter competition a great deal.

Mr. Caswell.—Have you any idea how many cheese factories there are established the last two or three years?

Mr. Barre.—I think from 12 to 14 per cent. has been the increase.

Mr. Moyer.—We must not lose sight that we are labouring under great disadvantages. It is simply from the fact that there is so much more power on the side of the cheese. Just think of it; I believe there is only a Frenchman and a Dutchman who have read papers here bearing upon butter production. (Laughter.) I believe our people are

as well satisfied where I am carrying on the creameries as those are where cheese is made. In fact, some of them are stockholders in cheese factories, so that I think we must just work a little harder because there are so many on the side of cheese. I tried to show you last night that if the farmer gets 15 cents for butter, that I consider it equal to 18 cents for cheese.

Mr. CASWELL.—I am glad to hear that gentleman speak about butter, and I would say for his information that we have always tried to bring the butter men forward, but so long as the feeling is that cheese pays better people will follow cheese-making. The reason there is no demand for butter is on account of the manner in which it has been sent out.

A MEMBER.—How would it be if you were to appoint a good man to go around among the creameries and butter factories to see that the people are doing right. The difficulty is now that they are all working differently and on their own responsibility. You will all admit that cheese-making has been benefited very much by those men you have appointed and paid out of the funds of this Association.

Mr. GILBERT.—I would say that in Central New York the difficulty we have had to contend with is that the butter factories have paid more for milk than the cheese factories. Some have skimmed their milk one, two and even three pounds and then sold the milk, and it was made into cheese. I know of some of that kind that was sold at the ruling price of cheese on the Utica market right straight through the season.

Mr. MOYER.—Will that be continued now that they have to brand their skim-milk cheese as such.

Mr. GILBERT.—That law has not yet been passed. If it was that will be stopped.

Mr. MOYER.—We are not so fortunate here as they are in New York. We sell things here for what they are. (Cheers.) I have been in the butter business a little longer than my friend Mr. Barre. I have never been able to get any encouragement from any one, and I did not expect to get a hearing here, but I am glad now that we are being looked upon as men who are trying to do a little work in this country.

Mr. SHAW.—I am very glad that the question of the comparative profits of butter and cheese has been brought up this evening. That is a question to which more attention will be directed before very long than it has hitherto received. I believe we have one of the very best countries under the sun for the production of butter and cheese, and I hope the two industries will go on side by side. I trust the day will never come when cheese-making will drive butter-making out of the land, or butter-making drive cheese making out. We have races of cattle in this country that are specially adapted for butter; others for cheese; and I would be very sorry indeed that even a shadow of rivalry should show itself between the two industries. Now, the question of the comparative profits is one that will not be decided to-night. The day is, perhaps, coming when it will be decided, and if any person in this assembly can answer the following question we shall have a very approximate idea:—

4th Question.—If any person can tell us the value of the cheese and the whey, less the cost of making, and also the value of the butter less the cost of making the skim-milk, and the value of enrichment of the land resulting from raising calves.

Mr. MCPHERSON.—I think it lacks one thing—the value of both in future.

5th Question.—To Mr. Richardson—Is it injurious to quality to haul whey back in the cans?

Mr. RICHARDSON.—I think it hurts the cheese a great deal; no doubt about it.

6th Question—Which is the best way to ventilate a curing house?
What time of day or night should air be admitted?
Should cheese have a higher temperature the first few days?

Mr. HARRIS.—The best way is to give it plenty of air. (Cheers.) We used to open the blinds and windows at night, and, in the morning as soon as the warm air came, shut

up all the windows and blinds and keep the hot air out. But it is a good idea to have ventilators so as to let the gas escape, I would recommend to let it out through the roof.

A MEMBER.—Where would you let the air in?

Mr. HARRIS.—At the bottom.

MR. ASHLEY.—They say we must keep the temperature about 65°; how will you do that when some of our nights are hotter than that?

Mr. HARRIS.—I never knew the weather to be quite as warm in the night as in the day time.

Mr. ASHLEY.—Well, I have.

Mr. BALLANTYNE.—This question of admitting air at night and cool in the day time is subject to modifications. We have sometimes that dull, damp weather when we have to be very particular about it. The cheese should not be melting; they should be drying. Ordinarily, Mr. Harris' plan is the best. You must exercise your judgment.

A MEMBER.—Have you ever tried sprinkling the floors in hot, dry weather?

Mr. BALLANTYNE.—Yes, but that will cause too moist an atmosphere. In very hot weather when the cheese is nearly ripe it might answer very well.

Mr. LOSSEE.—I would control the temperature in very hot weather by a draft coming off ice.

A MEMBER.—What effect has darkening the rooms on the quality of the cheese? the rooms are often darkened to get rid of the flies.

Mr. BALLANTYNE.—I prefer light. I do not know anything more important than opening the windows, but you should not let the sun on the cheese. The light has nothing to do with the cheese fly. Keep your air clear and you will never see these flies.

Mr. SPIERS now made reference to the Act to protect cheese-makers, saying it was defective, and wanted some steps to be taken to have it amended.

Moved by Robert Cleland, seconded by S. H. Cook,

That the Board of Directors of this Association be instructed to memorialize the Legislature to so amend the Butter and Cheese Act, so as to make convictions under it more easy and less liable to be set aside on appeal, and that a Committee consisting of Mr. Spiers, Mr. Dickson, Mr. Lockhead, and the mover and seconder, be appointed to report on the amendments necessary.

Mr. MOYER.—We want the Act amended so as to protect the butter-makers as well.

Mr. BALLANTYNE.—We will add your name to the Committee.

On motion, the resolution carried.

Mr. CHADWICK said that from his experience in the exercises of his duties as magistrate, he would confirm the sentiments expressed in the resolution. He said the Act was to a certain extent defective, in so far as regards the difficulty of getting witnesses. The law would compel him to convict the person, who had acted as a spy, as a trespasser. He thought the Act could be very materially amended.

After some discussion upon the subject, Mr. Ballantyne said he would advise them to get the advice of some legal gentleman as to the proper manner to proceed, and that they would be quite willing to pay some reasonable fee for the advice.

Mr. SPIERS,—I know it has put all our lawyers at a stand-still.

Mr. BALLANTYNE.—We have lawyers here equal to any emergency. (Laughter.)

Mr. COOK.—I think this case is a very important one, and as Mr. Chadwick has had a good deal of experience, I would ask that his name be put in the place of mine.

Mr. BALLANTYE.—Allow the committee to be appointed with power to take what steps may seem necessary.

7th Question.—Mr. Harris, what kind of a milk tester do you think should be used by cheese makers to show him if the milk has been tampered with or not?

Mr. HARRIS.—There are several kinds of milk testers. I saw some last season in Scotland which use alcohol and ether, a very complicated thing, but the most certain of anything I ever saw. They would weigh each sample of milk and put it into a tube and pour in ether and alcohol and shake it all up and get the fat and whey it contained : and then they would try another sample and compare results. It is the only true test you can have ; but the lactometer and cream gauges will do for ordinary purposes, or even the German pioscope ; but the pioscope will only show you weak milk. It will show if the milk has been tampered with, very easily, and then you can take the lactometer and go to the parties and show them the result of a test of their milk.

Mr. MORRISON.—Here is a gentleman who says he can put 40 per cent. of water in and his pioscope will not show any difference.

Mr. THOMPSON.—I took skim milk and tried it and it showed so-and-so ; then I watered it and stirred it up and tried it, and it showed no difference. (Laughter.)

Mr. BARRIE.—From my experience I think it is good only for a preliminary test. It is only to indicate that you should test in some other way.

Mr. THOMPSON.—When I was here last year I had a borrowed one, but Mr. Pearce, of London, handed me this one. Some say they are used only as a scare-crow. (Laughter.)

Mr. HARRIS.—The one you have may be wrong in some way. I have tested milk with the instrument for two seasons and find them to work all right. All we use them for is a preliminary test. It requires a pretty good eye-sight to test with them, however, and some experience too. If a person is colour-blind they cannot see whether it is alcohol, butter-milk, or anything else. (Great cheering.)

Mr. CASWELL.—I think I heard one man say that those things do a great deal of good. They have been a dread to the patrons anyway, and a guilty person is always a coward. I knew a man who adulterated his milk to see if Mr. Harris could detect it. Mr. Harris tested the milk and told him he ought to bring good milk to the factory. The man asked what was the matter with it, and Mr. Harris told him he had either skimmed or watered it. That man told me this himself. He said he did it to see if Mr. Harris could detect it with the pioscope.

Mr. SCHRAGG, of New Hamburg, also said that he knew of an instance in which a party was found to have skimmed his milk, by an examination of the milk by Mr. Harris.

8th Question.—To Mr. McAdam, is the quantity of salt 1 lb. to 56 lbs. curd, given in your paper, enough for summer cheese, or is that quantity for early cheese only ?

Mr. MCADAM.—That was only given in a general way. What would spoil one man's cheese, practically, might not be enough for another man's. The fact of the matter is, the amount of salt to be used must depend largely on the judgment of the maker and the dryness of the curd. Of course, use less in the spring ; when you want it to go off quickly in the fall it would do to use more salt.

Mr. CASWELL.—Would you use more salt if the milk was from cows on sandy and gravelly soil than you would if from clay soil ?

Mr. MCADAM.—I could hardly say which would need the most.

Mr. CASWELL.—I believe there is a difference as regards these two kinds of soil.

Mr. HARRIS.—I think it makes no difference with regard to the soil. It is altogether on the moisture or dryness of the curd. There is no doubt, though, but what one soil will make moister cheese than another. You want to manipulate the curd and salt differently.

9th Question.—Does the President consider the home consumption of cheese would be increased by making truckle cheese for the home trade in spring ?. J. C. Morrison.

Mr. BALLANTYNE.—Well, it is a question not easily answered. I question if very much of it would. It takes more milk to manufacture them, and a truckle cheese is not, under any circumstances, as fine as a large cheese ; too much rine on them. The demand for truckle is decreasing. They are required only for a few places.

Mr. MORRISON.—The grocer always calculates on a loss of 3 cents a pound on a truckle cheese. If truckle cheese was sold whole could it be done so as to save a loss to the grocer?

Mr. RICHARDSON.—They would charge more for making them.

Mr. CRAIG.—I think the charge, 3 cents, for cutting up is rather exaggerated.

Mr. MOYER.—I have had a little experience in selling cheese over the counter, and I find my customers wanted always to test the cheese, and that may account for the 3 cents.

Mr. MOYER here went aside from the subject under discussion, and said he wanted to know what was going to be done about the colouring of butter. He was entirely opposed to it.

Mr. BARRE said he could understand how, at certain seasons of the year, butter was made which had not the colour needed, and that therefore, it would be coloured. He said it must be made to suit the customer. Danish butter is coloured when it needs it.

Mr. MOYER.—I still hold to my theory of not representing what a thing is not. If we do drift into that practice, it may be difficult to get rid of it.

Mr. BALLANTYNE.—After all, it is just this: We have to go to the mountain, it will not come to us. The question of colouring cheese has also been ventilated, and it is now understood the demand for white is increasing, but even in New York to-day it is at a discount of a quarter of a cent a pound; a year ago it was the opposite way. While there are districts want colouring, you must give it to them.

Mr. CASWELL.—Is it not a rule that colouring makes white cheese good? White cheese must be very fine to bring the same price of other cheese. If two-thirds of the cheese were made white they would not bring within two or three cents the price they do when coloured. My idea is to give what is demanded.

Mr. MOYER.—Does the white cheese need to be of a finer quality to get over this prejudice against them?

Mr. CASWELL.—The white shows imperfections, but coloured cheese hide their imperfections.

10th Question.—Mr. THOMAS SHAW.—Would it be wise for this Association to offer a prize to the patron who secures the highest average of milk for the season with a certain number of cows, with a view of encouraging to higher effort in this direction, and of more accurately determining the average possibilities of dairy cows?

Mr. MOYER.—Would not that have a tendency to make them water their milk?

Mr. HOPKINS.—I would like to ask a question as regards the drawing of milk once or twice a day. What effect has it on the cheese?

Mr. LOCHHEAD.—We have always been in the habit of drawing once a day, and I think Mr. Ballantyne knows our average quality has been just as good, perhaps, as any in the country.

Mr. BALLANTYNE.—In connection with buying, our opportunities of observation may be more extensive than those in their own factories. I think the first two factories we started we thought it not possible to haul once a day. Then it was tried once a day, and the result was that they never had a bad cheese. The reason is clear to anybody, hauling it through the hot sun in the afternoon and putting a lot together, and perhaps it cannot possibly be kept till midnight as it should be. We find the farmers can keep it in a much better condition themselves. There are also other advantages connected with it. Taking it twice a day keeps the factory hands continually drugging and working, and tires them out by the time they are through at night, and are apt to let things go wrong because they are worn out. I would recommend hauling once a day.

Mr. CASWELL.—Two or three cheese-makers spoke to me to-day to ask you what your opinion is as regards making cheese on Saturday night. I notice often that the poor cheese is said to be Saturday night's cheese. Should we do away with Saturday night's milk, or how should we keep it? Can a first-class article of cheese be made from Saturday night's milk without working on Sunday?

Mr. Ballantyne.—Regarding Saturday night's milk, would say that if the milk is kept properly it can be delivered on Monday in good condition. It is impossible to make good cheese on Saturday night. They will be imperfect. If there is anything in Canada that we are most proud of it is our quiet, peaceable Sabbaths. (Cheers.) On the other side they never know the Sabbath on account of making cheese. Our men are giving their poor cheese-makers a rest on the Sabbath. It was no easy matter to discontinue the Saturday night, and we had to go slowly. I hope we will soon have no more Saturday night cheese. They are poor, inferior stuff at the best, and must under any circumstances interfere with the Sabbaths.

Mr. Caswell.—I think it advisable to move a resolution that something should be done to release the cheese-makers where some parties are continuing to make Saturday nights.

Mr. Shaw here referred to Question 10 in regard to the management of dairy cattle in feeding them for beef. He said he believed the farmers of Ontario were only accomplishing in three years what they should do in two; and what is the most practical manner of raising the standard of the dairy cow.

Mr. Cook.—I think it is a worthy object, but it should be carefully gone into.

Mr. Caswell.—There would be a good deal of trouble to arrange the thing right to make a proper experiment, so as to arrive at a correct result. I think it would lead to a good deal of competition.

Mr. Shaw.—I believe the dairymen of Western Ontario are running their machine in almost the best possible manner it can be run. I think, though, they might improve very materially upon the machine. The standard of the cow might be raised, and that very materially. This is a question that should not be considered too hastily. A great many things would be required to be thought over before adopting any plan. I might suggest that a committee be adopted to consider the advisability of the question, and meet upon some plan. I would move that this matter be referred to the Board of Directors.

Mr. Barre seconded the resolution, and it was carried.

12th Question.—To Mr. Ballantyne—Which makes the best wall for curing room, lath and plaster inside, or hollow wall filled in with sawdust?

Mr. Ballantyne.—I think the best non-conductor is a hollow wall. I so understand it; however, I am willing to stand corrected.

A Member.—Would it not be necessary, in the case of a hollow wall, to have it closed at the top, so that the air could not escape; have a dead-air chamber.

Mr. Ballantyne.—That is the idea.

Mr. Ashley.—Would it not be better to seal it up instead of plastering it?

Mr. Ballantyne.—I find those who have hallow walls have resisted the heat very much.

Mr. Barre.—What space would you have in the wall?

Mr. Ballantyne.—Would use the thickness of the stud—6 or 8 inches.

Mr. Morrison.—Referring to this prize spoken of, would it not be advisable to send a copy of the report of this meeting to all the patrons? I think it would tend largely to do good.

Mr. Ballantyne.—I would say that is one reason for holding the Convention early this year, that we can present the Report to the Legislature, and doubtless they will print a sufficient number for the Association for the members of the different ridings to distribute amongst their patrons. We once tried that, but it seemed to fail.

Mr. Chadwick.—I really do not think there is much encouragement to do it. A few years ago the Report of one of the Conventions was thought to be very valuable, and a requisition was made to print 10,000 copies. They cost 5 cents a number. I had the distribution of them, and it was with the greatest difficulty I could get rid of them. Many of the packages were returned through the post-office to me "uncalled for."

Mr. Morrison.—They were distributed in our neighbourhood, and I know all the patrons got them, and they valued them highly and they did good.

13th Question.—Is the very finest Scotch or English cheese equal to or better than the Canadian?

Mr. Harris.—I saw no cheese in Scotland or England that were as fine as the best of our Canadian cheese. Of course, I might not have seen the best in England, but I saw the best Scotch cheese there was in Scotland.

Moved by E. Caswell, seconded by L. R. Richardson, and resolved, That this Convention strongly recommends to do away with making cheese on Saturday nights, as many of our best factories have adopted this plan and found it a success, thereby doing away with the objectionable cheese always to be found when the practice of Saturday night making is adhered to, as, with ordinary care, Saturday night's milk can be kept till Monday morning and delivered in good condition at the factory.—Carried.

On motion, the Convention adjourned at 10.45 p.m. to meet to-morrow morning at 9 a.m.

THIRD DAY—MORNING SESSION.

Friday, January 16th, 1885.

The Convention came to order at the call of the President, Mr. Ballantyne, at 9.45 a.m.

Mr. Blue, of the statistical department, Toronto, read an address on "The Growth of our Dairy Industry, with Suggestions for its Further Development."

THE GROWTH OF OUR DAIRY INDUSTRY, WITH SUGGESTIONS FOR ITS FURTHER DEVELOPMENT.

By A. Blue, Toronto.

In this paper I shall aim to give a brief account of the dairy industry of Canada, to point out the unequal growth of the two main branches of it, and to offer some suggestions for its further and more symmetrical development.

The departmental reports and census returns of the Dominion do not furnish complete data, but they are ample enough to indicate with a measure of certainty the direction as well as the progress of growth.

The trade table gives us only the surplus production which finds a foreign market, not its aggregate quantity. Besides, these tables do not enable us to ascertain how much of the surplus is the product of each Province, the practice being to make and classify returns according to the port of shipments. As example—a very large proportion of the exports of Ontario to Great Britain are shipped at Montreal, and the Province of Quebec gets the credit for them in the returns of the Commissioner of Customs.

Then as to the census: It is taken at such long intervals, that, in a new country like ours, it is bound to treat us with surprises. The entire course of an industry may change in a period of ten years: in dairying as well as in every other agricultural pursuit a great deal depends on the character of the seasons, the activity of demand, the general state of trade and commerce, and other conditions as variant as these. In the decade of 1860-70 the manufacture of cheese in this Province underwent a revolution: the factory system was introduced, and the old system of cheesemaking on the farm exists now merely as a relic. Yet in the census we are given only the return of product of the home-made article. The product of factories is reported on the manufacturing schedules, where value takes the place of quantity, and no provision has been made (as in the United States census) to get returns of both quantity and value. The returns of butter factories have been collected in the same way, and the statistics are consequently defective in a very important particular.

With these explanations, which I think are necessary to a proper understanding of the subject, let us see what the census returns and the trade tables show.

According to the census, there can be no doubt that Ontario holds a place in the dairy industry at least equal to that of all other Provinces now composing the Dominion. Taking the number of milch cows and the products of home-made butter and cheese, the statistics of these censuses for Ontario and the Dominion are as follows :

MILCH COWS AND FARM DAIRIES.

	ONTARIO.			THE DOMINION.		
	1880.	1870.	1860.	1880.	1870.	1860.
No. of Milch Cows.....	782,243	638,759	451,640	1,595,800	1,251,209	959,951
Home-made Butter, lbs....	54,862,365	37,623,643	25,822,264	107,545,169	72,172,533	51,564,888
Home-made cheese, "	1,701,721	3,432,797	2,687,172	3,184,996	5,140,367	4,601,965

a each period, and under each head as above, the returns for Ontario were fully fifty per cent. of those for the whole Dominion, and as regards the number of milch cows and the product of home-made butter, the rate of increase was almost constant for the decennial years. The product of home-made cheese in the last decade fell off one-half in Ontario, and in the other Provinces about one-seventh—as a result of introduction of the factory system.

The statistics of cheese factories in Canada were collected for the first time in 1871, and the following table presents the returns of 1870 and 1880 for Ontario and the Dominion :

CHEESE FACTORIES OF ONTARIO AND THE DOMINION.

	ONTARIO.		THE DOMINION.	
	1880.	1870.	1880.	1870.
No. of Factories.....	551	323	709	353
Hands employed.....	1,638	909	2,003	998
Wages paid.....	$380,139	$110,763	$382,615	$120,026
Value of material used.....	3,686,710	1,136,078	4,264,798	1,249,904
Value of product.....	4,668,078	1,454,702	5,464,454	1,601,738

From these statistics we can only estimate the quantity of cheese made in the factories, and assuming the value to be the same as that of cheese exports in the respective years as given in the trade tables, the total product of Ontario and the Dominion is about as follows :

	1880.		1870.
Ontario.....	48,000,000 lbs.	....	12,500,000 lbs.
The Dominion.....	56,000,000 lbs.	....	14,000,000 lbs.

For our Province and the Dominion the rate of increase in the ten years is about four-fold, or at the rate of forty per cent. annually. Quebec has made considerable progress, and if

comparison was made by per centages it would seem to have advanced much more rapidly than Ontario; but in dealing with small numbers percentages are very misleading.

The factory system in its application to butter-making was introduced in Canada during the past decade, and is yet in its infancy.

According to the census the statistics of Ontario and the Dominion for 1880 are as follows:

CREAMERIES OF ONTARIO AND THE DOMINION.

——	ONTARIO.	THE DOMINION.
No. of Creameries	23	46
Hands employed	94	151
Wages paid	$21,213	$30,043
Value of material used	159,828	263,483
Value of product	212,480	341,478

Turning now to the trade tables, I shall compare the exports of butter and cheese from Canada with the imports into Great Britain for the fifteen years, 1869–83—about 90 per cent. of our surplus in those years having been shipped to British markets. The object of this comparison is: (1) To show the unequal growth of the two branches of the Canadian industry, and (2) to show that for some cause a great opportunity opened to us has been lost. The following tables give the quantities and values of Canada's exports and of Britain's imports for the fifteen years, together with the averages for three periods of five years each and the totals for the fifteen years:—

CANADA'S DAIRY EXPORTS.

YEAR.	BUTTER.		CHEESE.	
	Quantity.	Value.	Quantity.	VALUE.
	lbs.	$	lbs.	$
1869	10,853,268	2,342,270	4,503,370	549,572
1870	12,259,886	2,353,570	5,827,782	674,486
1871	15,439,266	3,065,229	8,271,439	1,109,906
1872	19,068,448	3,612,679	16,424,025	1,840,284
1873	15,208,633	2,808,979	19,483,211	2,280,412
1874	12,233,046	2,620,305	24,050,982	3,523,201
1875	9,268,044	2,337,324	32,342,030	3,886,226
1876	12,250,066	2,540,894	35,024,090	3,751,268
1877	14,691,789	3,073,409	35,930,524	3,748,575
1878	13,006,626	2,382,237	38,054,294	3,997,521
1879	14,307,977	2,101,897	46,414,035	3,790,300
1880	18,535,362	3,058,069	40,368,678	3,893,366
1881	17,649,491	3,573,034	49,255,523	5,510,443
1882	15,161,839	2,936,156	50,807,049	5,500,868
1883	8,106,447	1,705,817	58,041,387	6,451,870
Totals	208,040,189	40,511,869	464,798,429	50,508,298
Average of—				
1st five years	14,565,900	2,836,545	10,901,965	1,290,932
2nd five years	12,289,914	2,590,834	33,080,386	3,781,358
3rd five years	14,752,223	2,674,994	48,977,334	5,029,369

BRITAIN'S DAIRY IMPORTS.

YEAR.	BUTTER.		CHEESE.	
	Quantity.	Value.	Quantity.	Value.
	Cwt.	£.	Cwt.	£.
1869	1,259,089	6,923,210	979,189	3,083,850
1870	1,159,210	6,793,877	1,041,281	3,274,331
1871	1,344,783	6,939,040	1,216,400	3,341,496
1872	1,138,081	6,028,474	1,057,883	3,031,977
1873	1,279,566	6,955,264	1,356,728	4,061,456
1874	1,619,808	9,050,025	1,485,265	4,483,927
1875	1,467,870	8,502,084	1,627,748	4,709,508
1876	1,659,402	9,718,226	1,531,204	4,237,763
1877	1,637,403	9,543,332	1,653,920	4,771,393
1878	1,796,517	9,954,053	1,968,859	4,946,686
1879	2,045,399	10,379,451	1,789,721	3,824,017
1880	2,326,305	12,141,034	1,775,997	5,091,514
1881	2,047,341	10,866,151	1,840,090	5,245,115
1882	2,169,717	11,350,909	1,694,623	4,749,870
1883	2,334,473	11,773,933	1,799,704	4,890,400
Totals	25,284,964	136,919,063	22,818,612	63,743,303
Averages of—				
1st five years	1,236,146	6,727,973	1,130,296	3,358,622
2nd five years	1,636,200	9,353,544	1,653,399	4,629,855
3rd five years	2,184,647	11,302,295	1,780,027	4,760,183

These tables may be studied from two points of view : first, as to the rate of increase of Canada's exports, and Britain's imports ; and secondly, as to the relation which Canada's exports bears to Britain's imports.

It is obvious at the first glance that while our exports of butter have been almost stationary during the whole period of fifteen years, our exports of cheese have been expanding at a high and almost constant rate. It is equally obvious that the demand for both products in the British markets has been very active, and the imports of butter, especially exhibit an enormous expansion. Presented in tabular form we have the following comparison for the two countries :

RATES OF INCREASE.

RATE PER CENT. OF INCREASE IN	CANADA'S EXPORTS.		BRITAIN'S IMPORTS.	
	Butter.	Cheese.	Butter.	Cheese.
2nd 5 years' average over 1st year	—16·66	203·34	32·36	46·28
3rd 5 years' average over 1st year	1·26	349·25	76·73	56·60
1st 5 years' average over 1st year	34·20	142·00	1·85	15·43
2nd 5 years' average over 1st year	13·24	634·57	30·00	68·85
3rd 5 years' average over 1st year	36·00	987·80	73·50	81·78
15th year over 1st year	—33·88	1188·84	85·41	83·80

The rate of increase in Canada's exports of cheese is the more remarkable when we notice the slow growth of Britain's importations of that article during the last five years. Indeed it would appear that the British demand had almost reached its limit, for while the average annual increase of the second five years over the first was 523,000 cwt., the increase of the third over the second was only 126,000 cwt. On the other hand, the butter importations are seen to be largely increasing in volume,—the annual average of the second term being 400,000 cwt. in excess of the first, and that of the third 548,000 cwt. in excess of the second. The regrettable feature of the table is, however, the contemptible rate of increase shown in the exports of Canadian butter. It is evidence of a golden opportunity lost.

But in order to get a correct view of the matter it is necessary to ascertain the relation which Canada's exports bears to Britain's imports. In other words, what is the ratio per cent. of Canada's total exports of butter and cheese to Britain's total imports. It is shown in the following table :

Rate Per Cent. of Canada's Supply and Britain's Demand in—	Butter.	Cheese.
1st 5 years' average	10·60	8·60
2nd 5 years' average	6·79	17·88
3rd 5 years' average	6·00	24·56
15 years' period	7·34	18·20
1st year of period	7·70	4·10
15th year of period	3·32	28·80

That is to say, for every 100 lbs. of butter imported into England in the first five years Canada's surplus could have supplied 10·60, and for every 100 lbs. of cheese it could have supplied 8·60. But we see that in the third five years Canada's surplus was about one-fourth of the whole British importation of cheese, and less than a sixteenth of the butter. In the last year our export was 28·80 lbs. of the total 100 lbs. of cheese of Britain's import, but only 3·22 lbs. of the 100 lbs. of butter. Our average surplus of cheese for the whole period was 18·20 lbs. for every 100 lbs. imported by Britain, and had our exports of butter increased in the same ratio the aggregate for the fifteen years might have been 515,000,000 lbs. instead of 208,000,000 lbs., and the aggregate value $100,000,000 instead of $40,500,000.

We have all heard the story of the juror who undertook to explain to the judge why a fellow-juror was not in his place in court. "There are twenty-four reasons, my lord," he said, "why Mr. Brown is not here. The first is, he is dead ; the second is— "The first is enough," his lordship interrupted, and the remaining twenty-three were never heard of. So, doubtless, there are many good reasons why the export trade of Canadian butter is either making no growth or is slowly dying out ; but the one sufficient reason is, that we are not producing an article of a quality to make it sought after in the market. Thanks largely to the work and influence of this and the Eastern Dairymen's Association, the quality of Canadian cheese has been brought to a high state of perfection, its reputation has been established, and it is rapidly displacing the product of other countries in the British markets : a large and growing class of consumers want it, call for it, and will have no other if they can get it. Our cheese-makers now are specialists—careful and intelligent men and women who know every detail of their trade—and they very rarely make mistakes. How can we hope to make specialists of our butter-makers ?

In suggesting an answer to this important question I propose to refer very briefly to the systems that have been tried for a number of years in some of the countries of Europe,

an admirable report on which has recently been made by Mr. Jenkins, Secretary of the Royal Agricultural Society of England.

In the German Empire eighteen dairy Schools have been established since 1869, four of which have been discontinued. Of the fourteen now in operation, six make a specialty of dairying, seven give instructions in dairying and house-keeping, and one is devoted chiefly to instruction in house-keeping; ten take female pupils only, two take males only, and two take pupils of both sexes. The average time of the regulation course of study is 6¼ months, the shortest being 1½ months and the longest 12. In two of the colleges instruction is given gratis, and in the others the average fee is £11 17s., the lowest fee being £1 in a dairying school having a two months' course, and the highest £30 in a dairying and house-keeping school having a twelve months' course. The average time per week devoted to theoretical instruction is about seven hours, and the rest of the time is assumed to be occupied with the practical work of the schools. Two or three of these schools may be taken as types of all the others.

The most celebrated is the school at Roden, in Mecklinburg-Schwerin. It was established by Count Schlieffer, who has furnished the school building and the house and garden for the director, and who provides whatever may be required for experimental teaching, and the local government for the Grand Duchy gives a subventio nof £325 per annum. The course of instruction extends over six months, and is open only to young men at least eighteen years of age, who must already have had some experience in dairying. The number of pupils is limited to six for each term, who pay £7 10*s.* for the six months' instruction with board and lodging on the farm; but they are compelled to work in the dairy like paid labourers. There is, besides, another class of pupils who are either students belonging to one of the faculties of the University of Berlin, students of the high schools, or young farmers and dairymen who are unable to take the full course. These provide their own board and lodging, paying the rate of 25*s.* for a month's instruction in the class-room, are exempt from the performance of manual labour, and the length of their course is long or short according as they see fit to make it. The time of the university students is usually confined to the period of their vacation. The course of instruction consists in demonstrations in all matters of a practical nature by the dairy instructor, and a lecture of one hour's duration daily by the director. Great attention is paid to book-keeping, and to the principles of breeding and feeding as well as of dairying. Throughout Germany the Roden school is regarded as by far the best of its kind.

At Heinrichothal, in Saxony, is a dairy school where from ten to twelve young women are taught the theory and practice of butter and cheese-making. The farm consists of 150 acres of tilled land, grass and wood; twenty two Dutch cows are kept, and a large quantity of milk is purchased for the dairy. The pupils must be at least sixteen years of age, and they are required to pay £5 for a month's instruction, with board and lodging, or £9 for three months. The principal of the school, Mrs. Zeil, gives practical instruction in the following subjects: (1) Technical management of a dairy, including book-keeping; (2) Feeding and management of cows, and fattening calves and pigs; (3) Instruction in cooking; (4) House-keeping in general; (5) Management of poultry according to their season: and (6) Management of the kitchen garden. Theoretical instruction is also given by the teacher of agriculture at the winter school, which is subsidized by the district agricultural association. The young women attending this school are mostly daughters of proprietor-farmers of a moderate acreage, but some are daughters of large farmers, and Mr. Jenkins observes that a few from the towns who were about to marry young farmers, came "to learn everything connected with the management of a farm-house." The various kinds of whole-milk and skim-milk cheese are made in the school: and butter is made from sweet cream, not washed in or out of the churn, but worked with broad wooden knives, and finally on the butter-table.

A third dairy school is at Gross Himstedt, near Hildestein, and a farm of 150 acres is attached. It is managed by the farmer and his wife, who keep about thirty-five cows and make butter and skim-milk cheese. The Hildestein Branch of the Royal Agricultural Society of Hanover gave a subvention of £225 towards the starting of this school, and a varying sum is also given annually to aid in its maintenance. The condition of the society's subsidy is, that six pupils shall be provided with board, lodging and instruction in the

school in consideration of a payment of £18 each. These pupils give their services in the dairy until one o'clock, after which they are taught house-keeping and the elements of a general education. Servant girls are kept to milk the cows and do the other heavy work of the dairy, but if the pupils do not know how to perform any description of dairy work they are taught it carefully. In addition to those pupils contracted for by the association the principal of the school may take others for such time and on such terms as she may arrange privately.

In Denmark a system prevails, under the auspices of the Royal Agricultural Society, of apprenticing the sons and daughters of peasant farmers so that they may receive the practical education of dairymen and dairywomen—the course being two years and the payment for labour, a small sum, in addition to board and lodging. The apprentices never remain more than a year on one farm, and the farmers or managers of estates where they are placed give any necessary explanations which they may require. Each apprentice is bound to keep a diary of what takes place on the farm, and to write a report on it. Young men and women who have earned the Royal Society's certificate of apprenticeship are much sought after to fill such situations as head dairymen or dairywomen on the large farms, and by applying with intelligence and industry the knowledge thus gained they often rise to much more responsible posts.

Besides the Royal Society, there are about seventy local agricultural societies in Denmark, who hold local shows during the summer and have meetings for discussion during the winter. "These societies," Mr. Jenkins reports, "also engage the services of skilled persons to give advice to their members on dairying and farming matters, and some of them engage travelling lecturers, who must always have obtained their agricultural diploma."

In addition to the work of these societies, however, almost every large dairy farm of good repute in Denmark is a practical school of dairying for farmers' daughters. These young women remain on the farm one or two years, doing all but the heaviest work of the dairy, and getting in exchange for their service, instruction, board and lodging, and sometimes £2 or £3 per annum. As a rule there are not more than three or four pupils in a dairy at one time, but Mr. Jenkins mentions one where about a dozen farmers' daughters are received as working pupils, who are boarded and lodged in the farm house and remain for various periods extending from six weeks to two years. The pupils who remain only a short time pay for their instruction a considerable amount relatively, but they all work as hard as an ordinary dairymaid could be expected to do.

As to the result of this system of dairying education in Denmark, a brief extract from Mr. Jenkins' report will suffice:

"In 1860, Mr. Rainals, then British Vice-Consul at Copenhagen, reported that the butter, or the article sold in the market by the yeomen farmers under that name, is execrably bad. At present Danish butter, in its season, has practically no rival on the London market. This result is directly traceable to technical instruction."

In England there does not appear to be any regular school for giving either theoretical or practical instruction in dairying,—the nearest approach to one being an arrangement between Cirencester College and a neighbouring dairy farmer, under which students are admitted into his family for a fortnight for instruction in cheese-making on the Cheddar system. For this brief course the student pays the farmer a fee of ten guineas.

The Munster dairy school is doubtless the most successful of its kind in the United Kingdom. It is one of the twenty model farms established in Ireland about thirty years ago—of which there now remain only the Munster farm and the Albert Institution of Glasnevin, all the others having been abolished ten years ago. The Munster school was preserved only as an experiment for reviving the butter trade of Cork. The Commissioners of National Education were urged by a local committee to co-operate with them in making the Munster farm "a centre for important agricultural experiments, a school for practical instruction for agricultural students, and a training establishment for the education of dairymaids." Assent was given to this proposal, and it is stated that the experiment thus far has been eminently successful. Sir Patrick Keenan reports that within three years a hundred dairymaids received a course of training of at least six weeks' duration each; that the butter made at the school almost immediately obtained a high reputation; and

that at the Birmingham dairy show in 1881, the success of the school produced quite a sensation in the agricultural world. "The success so rapid and complete of this school," Sir Patrick observes "is said already to have increased the value of the dairy produce of Munster by so large a sum that I hesitate to record it." The inspector of the school also reports that dairymaids who have been instructed in it are in constant request by noblemen and extensive farmers, and that in this way a profitable means of livelihood is opening up to a large class of girls. The training in dairy management in this school includes: (1) Elementary instruction in the nature of food and the feeding of milch cows, and in the nature of milk and its products; (2) Practical demonstrations in the most approved modes of handling milk and of making butter; (3) Such other subjects as the commissioners and committee may determine. There are two sessions of six weeks each in the year, occupying the vacation of the agricultural school, and the fees are £3.

There is also in operation in Ireland a Travelling Educational Dairy, introduced by Canon Bagot and promoted by the Royal Society. The instruction is given in a small car fitted up with complete dairy utensils, and which may be moved from place to place either on its own wheels or on the railway trains Where its service is required by one or more farmers or a local society for a week or a longer period, a public exhibition is given of its operations, and lectures on butter making are delivered by one of the officers in charge. In this way it is stated that information of a very useful and practical character is given to the sons and daughters of peasant farmers, and the line of march of the Travelling Dairy through the country may be traced by the marked improvement in butter-making which is seen to follow in its train.

Now, what can we learn from an acquaintance with those various systems pursued on the other side of the Atlantic that is suitable to our circumstances in Ontario? We have seen that it is the practice of agricultural societies and local governments to grant subventions to small schools, and even to the owners of private dairies, on the condition of instruction being given to pupils on favourable terms. May we not adopt a similar plan in Ontario, particularly in those sections of it where there are no cheese factories and where farm dairying is generally followed? Our country has reached a stage of progress now, in which, as regards rearing improved breeds of live stock, growing the finer qualities of fruit, pursuing a thorough system of tillage and finding out new inventions for implements of husbandry, the commercial advantages are a sufficiently impelling force to keep the wheels of progress in steady revolution without the continued incentive of the prize system. Why should our Township, Electoral District and Provincial Associations go on expending large sums of money every year for objects already attained, when other fields of equal if not greater capability are lying fallow before them? There is a vast opportunity for usefulness in promoting the manufacture of an improved quality of dairy butter in our Province, and it is almost absolutely certain that if a systematic effort was made to do for the butter industry what has already been done for cheese, the annual productive wealth of the Province might be increased by millions. I think it is doubtful if, during the lifetime of this generation, there will be any general adoption of the butter factory in Ontario—the advantages of the cheese factory are more obvious to farmers, owing to the more direct conversion of raw material into cash; but this is only an additional reason for taking active measures to provide a well-trained buttermaker for every dairy farm. I am hopeful that great good will result from the opening of the dairy school at Guelph, especially if a session for young women be opened during the summer vacation of the Agricultural College. Yet after all is done at the Government school that can be done, tens of thousands will remain without the benefits of instruction, and unless the agricultural associations or other local bodies join in the movement, progress will be painfully slow. What technical instruction has accomplished in Denmark and in the neighbourhood of Cork, it would accomplish in Ontario, and it seems eminently desirable that opportunities for its diffusion should be provided in a generous spirit. Those engaged in the cheese industry have nothing to fear from such a movement, for the cheese factory is too well established to be displaced by any kindred rival. Besides, there is "ample room and verge enough" in this broad Ontario of ours both for the factory and the farm dairy; for in spite of the great development of the factory system within the last twenty-five years

the milk product of two-thirds of the milch cows of the Province is consumed in the farm dairy.

DISCUSSION ON MR. BLUE'S PAPER.

A MEMBER.—Is the quantity of butter manufactured in Ontario increasing or decreasing?

Mr. BLUE.—A reference to the census shows it to be increasing.

Mr. MORRISON.—Have you got the statistics for 1884 of the butter manufactured for that year?

Mr. BLUE.—They are not tabulated yet.

Mr. BALLANTYNE.—Mr Blue has taken means to get full statistics, and if you will all try and send in the returns you will assist him very much. If you do so every month you will get a very close estimate of the quantities being made all the time, and you can compare with the previous figures and govern yourselves accordingly.

Mr. LYNCH.—About three years ago I made a statement by which some of you might think that I was against the factory system of making butter, but I find now that Mr. Blue from his statistics has come to the same conclusion, and I have great pleasure in endorsing what he has said.

Mr. BALLANTYNE.—These institutions are new with us, and I think will be of very great importance in the development of both butter and cheese interests in our country. One or two difficulties we have to contend with; the most serious is to get farmers to understand their duties both in the selection of stock, in feeding them, and in the taking care of their milk; and we have never been able sufficiently to reach that class. They have not attended our conventions in sufficient numbers to make their influence felt throughout the country, and it has been found necessary to keep up a running fire all the time to tell them what to do and what they should not do. I believe the farmers' institutes that have been started in the country can be immensely utilized by having the meetings in all the different centres, and that, as well as other subjects bearing upon agriculture, can be fully discussed. I hope our leading dairymen will try and attend the meetings and take a lively interest in the discussions to help them on. There is to be one at Woodstock to-morrow, and I think it will be a good one, as they have made great preparations to have it so. I think there is more cheese made north of Woodstock within a radius of ten miles than in any other place in North America of the same size; and, on the whole, they have the best factories. We should all try and attend these as much as we can, and try and help to educate the farmers as to their duties.

Prof. Brown, of the Agricultural College, Guelph, submitted the following notes on "Cream Gathering System:"—

1. The building cost $3,000 and the machinery $1,000, in all $4,000, as capital account.

2. The building consists of a receiving-room, wash-room, working-room, cream vat-room, office, ice-room, store-room, engine-room, and four dwelling-rooms for the butter-maker.

3. The machinery consists of two cream vats, two churns (200 and 300 gallons respectively), one butter worker, one boiler and engine of six horse-power, the whole capable of making one ton of butter per day.

4. The creamery was worked experimentally for 33 days in September and October.

5. There were 61 patrons, who gave cream from about 250 cows.

6. The cans used were the common shot gun ($3\frac{7}{10}$ gallons, $8\frac{1}{2}$ x 18 inches for milk space), two inches of cream on which are said to be the standard for one pound of butter.

7. The average daily receipt of cream from each patron was fully 2 inches or 4 on the can, from four cows by estimate.

8. The average price paid for the inch of cream (2 inches on the can) was 20½ cents.

9. This by estimate was equal to 10 cents per cow daily.

10. By estimate it took 2⅕ gallons, or 23 lbs. of milk, to produce the 1 lb. butter inch of cream.

11. The average price obtained for the butter was 28 cents in Britain, 29½ in the States, and 25 in Canada, irrespective of cost of delivery.

12. The prices obtained for butter per. lb. from various agents were :

London, England	28 cents.
Liverpool, "	28 "
Glasgow, Scotland	28 "
New York	29 "
Boston	30 "
Montreal	25 "
Toronto	26 "
Guelph	24 "

13. The average daily make of butter was 125 lbs., by churning 50 minutes, the cream having been kept in vats for 12 hours at a temperature of 62°.

14. 1,763 gallons of buttermilk were got from 3,655 inches of cream, being in the proportion of ⅔ of a gallon of buttermilk to every pound of butter, or every inch of cream may be said to have consisted of nearly *one-half buttermilk.*

15. Buttermilk fetched 10 cents per gallon delivered in the city, and on an average is worth 3 cents per gallon for sale or pork feeding.

16. Butter was salted at the rate of 1 oz. to one pound, and packed in pine tubs of 62 lbs.

17. The average route in cream gathering was 11½ miles out and in, or 23 miles daily travelling for one team.

18. The skimmed milk left at home by this system is estimated to be worth half price, or 3¼ cents per gallon, thus for every inch of cream or pound of butter removed there was left 7 cents of skimmed milk.

19. From the accompanying estimate the following analysis of the cost of a pound of butter is obtained :—

Gathering	2½	cents.
Cream, cost	19	"
Making	1¾	"
Marketing	1	"
	24¼	
Less value of buttermilk	1¼	"
Actual cost of production	23	"

20. It costs the farmer about 5 cents in summer and 10 cents in winter to produce one pound of butter.

ESTIMATE FOR A CREAMERY SUPPLIED FROM 500 COWS.

Receipts.

Sale of 67,000 lbs. butter at average of 27 cents (500 cows), May to October	$18,090 00
Sale of 30,000 gallons buttermilk, part sold and part feeding pigs, etc., at 3 cents, average	900 00
Total	$18,990 00

Expenditures.

Paid for 65,000 inches of cream at average of 19c..	$12,350 00	
Four gathering teams at $2.75 per day	1,300 00	
Butter-maker at $65 per month.....	390 00	
Assistant and occasional outside Inspector.	250 00	
Butter tubs, 1,300 at 35c.....	455 00	
Fuel, oil, etc., for engine.....	30 00	
Storing ice.....	40 00	
Salt, colouring and linen cloth.....	50 00	
Repairs and incidentals	50 00	
Books, postage, etc.	10 00	
Freight on delivery of butter at various markets ..	325 00	
Interest on $4,000 invested capital	320 00	15,570 00
Balance being profit		$3,420 00

NOTE.—The patrons to pay for tanks and cans.

Prof. Brown now read his address on "Ensilage in the Dairy."

ENSILAGE IN THE DAIRY.

BY PROFESSOR BROWN.

It has been long a subject of comment that Canada has no place in the markets of the world as a producer of good butter; that we are notorious enough for a certain kind of butter, and that all the appliances of the country pointed to a very different condition of this branch of farm industry.

A very great deal of theoretical teaching has been growing upon us on this subject during the last three years, and this Province to-day is pretty full of its literature, though not of good butter. Several influences have contributed to public action in this neglected business. There has been, as already stated, American and European censure, which, honouring us with all that could be advanced in praise of our cheese and beef, eggs and poultry (not mutton), could not account for the total dearth of even ordinary butter; thus also, private enterprise in dairy implements made some warm discussions here and there, which have of late developed into the advocacy of three systems for the manufacture of butter—that of each farmer making his own; that of cream gathering and manufacturing at established places, and that of the Centrifugal system. In addition to these there has been, as there will be in most affairs, a desire for change in those districts where disappointment, real or fancied, has followed the introduction of some other industry, and I think it is right to say that the Legislature has had all, and more than, a fatherly interest in the improvement of Canadian butter.

With the view therefore of putting to practical test as a profitable investment for individuals or companies and for educational progress, the Ontario Legislature resolved to establish a Butter Manufactory in connection with their Experimental Farm, which has been named "The Ontario Experimental Farm Creamery." The personal inspection and advise of Mr. Wanger, of Darlington, Illinois, were secured during the month of May. This gentleman's standing as a practical expert in the cream gathering system is well known everywhere, and his recommendations have been strictly adhered to during the past season.

In company with several friends of the enterprise Mr. Wanger visited farmers in the neighbourhood of Guelph, explaining the working of the same, and indicating how it would affect the patrons financially. Receiving sufficient encouragement by this tour the Government proceeded to alter the internal arrangement of what we call the old cheese factory, a brick building situated in the new orchard, field 10 of the farm, and in due course the machinery and all appliances were ready for a start as late, for the season, as 25th Septem-

ber last. Sixty-one patrons were secured who promised cream from about 300 cows. Their position necessitated three routes for gathering—one team, or single horse, being employed at each daily, or every alternate day as required. The short coin can of $3\frac{7}{10}$ gallons, $8\frac{1}{2}$ inches diameter, and 18 deep, graduated in the usual way, and two inches of cream on which is the standard for one pound of butter. These were distributed along with ash tanks of two sizes, as required for setting the cans in cold water. Minute instructions were given to each patron in regard to thorough system, cleanness, temperature, setting and skimming. The teamster of each route performed the skimming in presence of the patron, both noting the number of inches in their books, and the same at once entered in the "Cream Ledger" on arrival at the factory. The cream being poured into the vats was allowed to obtain a certain acidity before churning. What that acidity was we do not know, nor possibly could it be explained by figures or letters any more than many other things in practical manipulation among experts, at the same time it seems to me that some simple chemical test might be employed. Cream was usually churned the day following arrival. The temperature of the creamery was kept about 60° and churning took 50 minutes average, by 45 revolutions per minute of a four sided box churn. The accompanying plan of the creamery will give an idea of arrangement in which are shown two churns, one of 300 and another of 200 gallons each. The engine is six horse-power, and separate from the boiler, shafting and belting being simple in arrangement. The butter was packed in six pine tubs that held 62 lbs. each.

In one word, the old cheese factory has been made into a very commodious butter factory capable of making easily one ton daily—our American friends have said two tons as a maximum.

It would be of no practical value to give any figures of cost of management, plant, etc., because everything has been so initiatory, and was so late in the season that they would mislead; those will be fully classified next year, after what we trust will be a good average season.

The encouragement, under the limited experience thus briefly detailed, has been most gratifying. In the first place, all our patrons—one excepted—are preparing to add very considerably to the number of cows; they—the wives and daughters especially—are well pleased with the system; they say it lessens their labour most materially, and as they get as much or nearly as much for the cream as for the butter made by themselves, they cannot but feel satisfied; the farmer himself is doubly pleased—first that his fair helps are thus saved much labour—that he is not required to do any hauling or run any risks as a sharer in the manufacture, and that all the milk is left at home for calves and home use in any form.

Then also we have been promised and offered without solicitation a large addition to our patrons in the immediate neigbourhood. Not only so, but I hold several letters from parties at considerable distances offering to guarantee 100 and 200 cows if we will make special routes for them, and it has even been suggested that we should go there by railway. It will therefore be my duty to make very early arrangements with the Commissioner of Agriculture for next season.

We sent three tubs each to well-known commission agents in Montreal and Toronto, in New York and Boston, and in London, Liverpool and Glasgow, inviting the most free criticisms on the quality of the material. As their opinions should be of some value to the country, and of practical application to the creamery, I beg to give extracts from their letters so far as received.

(*From G. Bowles, Esq.*)

13 West Smithfield, London, England, 6th Nov., 1884.

"I beg to state they are three tubs of fine butter, and will sell freely here at 13[illegible] and as weather gets colder will go for 140*s.*; the color is all right, the only fault is it is a shade too salt. Send me all you possibly can."

(*From Messrs. H. A. Ayer & Co.*)

Montreal, 10th Nov., 1884.

"We have looked at it critically; two tubs of it are really fine, such as we are paying twenty-five cents for, but one tub is much coarser and more ordinary."

(*From Messrs. Wiggin & Upton.*)

9 North Market St., Boston.

"We have given it an examination and find it very good. We think we can handle your goods to advantage, and if you have some smaller tubs we think it would be well for families."

(*From Andrew Clement, Esq.*)

Cheese Bazaar, Glasgow.

"I am glad to say the quality is up to the mark, it is just a little over-salted, and too high in colour for our market, but this can be easily remedied: the colour we like is just a nice straw, not the deep red colour of yours. I have sold it at 130s. With the slight improvements I have suggested it would take well on this market, and at all times meet with a ready sale, I think your Commissioner is doing an immense benefit to the country in giving such an opportunity to dairymen of learning their business on the best lines of butter and cheese."

(*From Messrs. Borger & Co.*)

82 Warren Street, N. Y., 25th Nov., 1884.

"We examined very carefully:—One tub was fine in flavour, straight in colour, and in every way high quality; the others were not clean flavoured, and had light streaks and spots in colour."

On 3rd October Mr. Wanger wrote me as follows:—

"Should any points arise in the management of the business, I hope you will make free to communicate with me; anything I may do to aid you shall be free. I feel measurably responsible for the successful inauguration of this system in Canada. Pay your farmer all you can for cream. We are paying at present nineteen cents for cream, and selling the butter for thirty cents in New York, leaving a profit net to us of five cents per pound. The question with your people should not be, does their butter suit us, but does it suit the export trade; your creamery butter should fetch ten cents more in market than good dairy butter; you will see a wider difference than even this if you refer to the Boston, New York and Philadelphia markets. If Canada through the creamery system can double the value of her butter, and at the same time cheapen the cost of making, she has made the two spears of grass grow where but one grew before."

Discussion on Prof. Brown's Paper.

Prof. Brown.—In England they are doing a great work in ensilage, being able to produce it with less acid; but I fail to find, either in the States or Canada, sweet ensilage. There seems to be something in the alcoholic stimulant in ensilage that seems to make the

animal system produce more milk and a larger quantity of cream, but not the same proportion of butter. The butter we are now producing, however, is of quite a different quality from that submitted to you four years ago—much better.

Mr. SHAW.—Is it the intention of the Agricultural Farm to repeat these experiments

Prof. BROWN.—Yes, if I have anything to do with it; but it will take several years to arrive at any satisfactory conclusions.

Mr. BARRE.—I must say I was deeply interested with the most valuable paper of Prof. Brown, and, if I did not know him, I would be surprised at the ability which he shows in grasping and looking into facts. He has done a vast amount of valuable work in a short time at the experimental dairy station. It shows you the importance of such an institution in your midst, and the sagacity of your government in establishing such a station. The first thing that comes to our notice is the importance of knowing the size of the butter globules in the milk. It shows the influence of that size in the skimming of milk, and it also shows the difference in the value of the different systems of skimming milk. It has been proved here and in Denmark in experiments of this kind that we can obtain from fifteen to forty per cent. more cream from the same quantity of milk by the centrifugal than by any other system. Since the ordinary method of skimming milk practised in this country is the deep setting in cold water, and that method has given as a rule forty per cent. less than the centrifugal system, you can form an opinion of the loss incurred by this country, and it also gives you an idea that some more experiments must be made in this connection and more knowledge of this system had in the country. May I ask Prof. Brown what were the objections to the form of the vessel?

Prof. BROWN.—You mean the milk vessel? I did not say objections, but asked whether the plain shot-gun can was the best form or not.

Mr. BARRE.—I thought you mentioned some one objected to it.

Prof. BROWN.—Yes, I said that some said the Fairlamb was better.

Mr. BARRE.—If you take into consideration the facility of handling, I think the shot-gun as good as any.

Mr. MOYER.—As a butter man, I would like to make a few remarks on this question. I am afraid Mr. Barre seems to favour the centrifugal system. I believe, if it was practicable in our country, that it would be the best thing to separate the cream from our milk, but we must apply that which is practicable. We can only introduce that in our country which we can carry out. In looking over those figures I find it is quite different to go into the country and do business out of which you want to make a living than to do it for experiment and give it to the farmers. I think, perhaps, the system adopted on the Model Farm is not doing the cream system much good, not so much as it might. I see, for instance, that twenty and a half cents was paid for butter. This is a little higher than we have been giving. We have to work on a margin in Bruce. Our people will hear this, and will say they want as good a price.

Prof. BROWN.—We only paid the local prices for butter.

Mr. ASHLEY.—You pay the farmers twenty and a half cents for the cream and then do the work of gathering the cream besides. You want to take into account the cost of gathering the cream and the cost of manufacturing.

Mr. MOYER.—I thought it was, perhaps, not doing us justice as private enterprising men to go into the business to carry it on. You see our people will be guided, more or less, by the price paid by the Model Creamery, and they expect to get just as much from us as the people who, fortunately, live around the creamery at Guelph, so that it may have an injurious effect upon the system in the country.

Prof. BROWN.—Kindly tell us the system in Bruce.

Mr. MOYER.—In the first place, the cost of that building you mentioned would be enough to frighten any in the country to start in the business. It is, of course, very nice to have a nice factory, but we must start on the small scale and make it so it will with the people. Perhaps it would have been better had our cheese factories

built better on the start, but we were making our cheese in factories such as you would not now work in, perhaps. I think we could put up creameries suitable for the country and make an article just as good with the expense of a thousand dollars, putting in all the machinery and appliances necessary to make a good article.

Mr. RICHARDSON.—What size of a building would you make for $1,000 ?

Mr. MOYER.—Large enough to make a ton of butter every day.

Mr. MOYER.—There are objections to the can. I think the can we are using in the country is the most suitable for the farmers. The cover is put on and then the whole can submerged in water. The air in the can keeps the water out, and any animal odour that is in the milk can escape and is taken up by the cold water on the outside of the can. Some people object to having a tap in the bottom of the milk dishes to draw off the milk on account, they say, of the sediment being left in the cream. I would say that it is better to be careful to strain the milk properly when put into the can than to make some machine to get rid of it again. I hold it is essentially necessary, in our country, that we bring in a system that the farmer can skim the milk, because they put a good deal of value upon the skim milk, and it is only right that they have it in the best possible condition and at the proper time to give to their calves. Prof. Brown must know that feeding the skim milk to the calves has a very injurious effect on them when it is some days sweet and some days sour, or half sour. By allowing the farmers to skim the milk they can get it right. The cream can be taken every other day in the summer, and in the fall when the weather gets a little colder every three days will do. I find the great objection the farmers have to our skimming at the factories is, that they have not the milk when they want it.

Mr. MOYER.—Would Prof. Brown consider the feeding qualities of buttermilk equal to that of skim milk.

Prof. BROWN.—I cannot tell, may be, for two years yet.

Mr. MOYER.—I think it contains a good deal more water.

Prof. BROWN.—In Scotland we thought it worth half the value, but, as regards what it will do in this country, I do not know.

Prof. HARE.—There is the very same quantity of flesh-producing substances in the buttermilk that there is in the skim milk ; that is, the albumen in both are equal ; although there is a larger proportion of water in the buttermilk than there is in the skim milk, that will not alter the nutritive value of the buttermilk. Provided you give him all the buttermilk he will simply have a little more water to pass through his organs.

Mr. MOYER.—That is information I am glad to receive.

Prof. ARNOLD.—I am much pleased with the industry Prof. Brown has displayed, but, as I told him some time ago, I think he is on the wrong way. I still hold my opinion that there is no reliance as between the quantity of cream and the butter-making value of milk. There is an approximate value which I would have recommended those who have scientific ability to investigate. An approximate value can be arrived at by taking different samples of milk from each cow in the same condition and note the per cent. of cream, multiply the per cent. of cream by the weight of the milk in each case and you will get a comparative result. That would do for him, but not for Mr. Brown. There is, in the first place, a quantity of milk that goes with the cream, and then there is difference in the structure of the cream which Prof. Brown has been showing. I must say I admire the illustrations Prof. Brown has given. It gives a good idea of the different structures of the butter-making quality in milk. These different structures affect the churning capacity of the cream. The difficulty with the Ayrshire breed which he said he did not get as much butter from is easily seen if you look at the picture on the wall. The cream of the Ayrshire contains many more small globules than that picture shows, and when you churn the cream the largest globules stick together first, and of course all the small ones are left in the buttermilk. Now this is why the buttermilk of the Ayrshire is boasted of so much. This is where the difficulty comes in.

Prof. BROWN.—I have to thank Prof. Arnold very much for his criticism, and I must bow to him, as being only a student.

Mr. CASWELL.—I would like to ask Prof. Arnold about a remark he made yesterday in reference to the curing of early cheese. There seems to be some difference of opinion on that subject.

Prof. ARNOLD.—I have hammered away so much at this question that I selected something else to talk to you about to get rid of it. I told the cheese-makers when here that there was no difficulty in curing spring cheese, even hay-made, if they would take certain directions, and these directions were, first, a little more rennet than usual in order to hurry the curing. The way I did it was this: I put in a quantity of rennet that would curdle the milk in fifteen minutes at ninety degrees. The next step was to ripen that cheese by a short cut; keep it warm in the sink, and after you get it out of the whey keep it warm. An hour at ninety degrees out of the whey is worth a week in the curing-room at seventy degrees. You can cure a cheese in forty-eight hours fit to put on the table, of course not thoroughly cured, but in a good condition to put on the table or to ship. From having hurried it to a certain pitch and then stopping it does not ruin the cheese. It has only been pushed in six or eight hours what may have taken three or four weeks to accomplish. It will last just as long as it would if it had been three or four weeks in curing. This curing before putting it to press is the kink in making early cheese.

QUESTION.—How much salt?

Prof. ARNOLD.—Use your own judgment about it; just to your taste. Of course the more salt the longer it will be in curing.

Mr. CURTIS.—Did you ever notice pin-holes in the curd when you let it stand?

Prof. ARNOLD.—Yes; it is simply the rapid curing that causes the gas to develop faster than it can escape from the curd. It does no harm to the cheese. It is only a matter of appearance. The holes only make a prejudice against the cheese.

Mr. BRINTNELL.—I am interested in the curing of cheese to a certain extent, and would like to ask Prof. Arnold if he thinks cheese can be cured successfully pressed in a box instead of a bandage, so that when it comes from the press it has got the box on it except the lids on each end?

Prof. ARNOLD.—I have not had experience enough in that line to settle any question, but I have made some observations in the last two or three years which have been very favourable towards curing cheese in that way. I have, during the last season, cured one vat by putting it into boxes as soon as it was out of the press, and they are there yet, except one I cut for my own use. I found some I made in that manner saved about twenty per cent. of shrinkage, and I may say, it cured better.

Mr. CASWELL.—What was the difference in the coat of the cheese you had in the cellar and those left in the factory?

Prof. ARNOLD.—The cheese in the cellar was pronounced considerably better by those who examined it with myself. Those we left in the factory under the table were next, and those on the table were poor. Those on the table had cured the least, to my surprise. They had dried down like skim cheese.

Mr. CASWELL.—Would it effect the full cream cheese in the same way?

Prof. ARNOLD.—I did not make that comparison.

Mr. BALLANTYNE.—What would the difference in the temperature be between those on the shelves and those in the boxes?

Prof. ARNOLD.—Probably no difference.

Mr. CURTIS.—With your cheese cured in the vat, did you get the oxidation sufficient so that you obtained the same high flavour as if cured in the curing room?

Prof. ARNOLD.—Yes, sir, you get a little more flavour. You get flavour before you get it cured.

Mr. CURTIS.—In curing in boxes in the cellar, or set in a room anywhere, will you get the same flavour as where exposed?

Prof. ARNOLD.—I do not think so. It will take a longer time to do it. I wanted to see if the air penetrated the box.

Mr. BRINTNELL.—Do not you think a box would be an advantage in hot weather?

Prof. ARNOLD.—No, I do not think so.

Mr. BRINTNELL.—In some of the factories south of Ingersoll I saw the butter had ran from cheese enough to oil the floor, while those cheese in the boxes did not appear to be so affected by the heat.

Prof. ARNOLD.—That is another point. One advantage in curing in a box—it would take some time for the heat to get through, and the temperature would be more uniform. It would, no doubt, keep it from extremes of heat and cold. About the time the heat gets through the box so as to begin to affect the cheese the temperature in the room would be going the other way, so that it would then cool down without affecting it. I think it would avoid the separation of oil.

Mr. MCPHERSON.—In my experience with regard to the curing of cheese I find that moisture has a very active part to do, and it is a thing which makers usually lose sight of, I think.

Prof. ARNOLD.—Moisture is just as essential as heat or rennet. They are all connected. After cheese goes out of the factory and gets on the road there is no more curing to it. It should be fit for use when it leaves the factory, or nearly so, because shipping in the spring would generally chill it right down, and, if not cured, would be liable to make it bitter and not fit for use.

Mr. MCPHERSON.—I think the market demands a cheese without much flavour.

Prof. ARNOLD.—If I wanted to get a thing like that I would close the box up as tight as possible.

Mr. BALLANTYNE.—With regard to flavour I would say, we were shipping one season very close to the loop, and it was a question whether we would get them to the English market in a green state, and whether we were not interfering with the curing of them; but we left some of them on the shelves to find out and put some under the shelves. We found those left on the shelves exposed to the air while curing developed a good flavour; but would advise that they be put away in some cool place as soon as they are cured.

Mr. BRINTNELL.—Do you think cheese in a box with both ends exposed, would it be injurious to the cheese?

Mr. BALLANTYNE.—I am afraid it would. There must be some moisture about it. It might injure the rind.

Mr. BRINTNELL.—I made some cheese at the Nanecekeville Factory and pressed one of them into a bandage and one in a box and had them examined by some buyers, covering them so as to exclude sight of the boxes and bandages, and I found it was about impossible for them to tell the difference—which was the better of the two.

Mr. BALLANTYNE.—Oh, yes! it was very decided, the difference. I think you must have misunderstood them. In saying this, I do not want anyone to understand that I am against pressing cheese in the box. In justice to Mr. Brintnell, I would say that I thought he had conveyed the idea that the cheese in our office was equal to the other cheese pressed in a bandage. It was poor at one end, but, if it was good at the other, why that would not be attributed to the box.

Mr. CASWELL.—What is the cause of an oniony or garlicky flavour?

Prof. ARNOLD.—I think it is caused by bad rennet being used. I think what came under my notice was caused by some kind of ferment in the rennet which changed it entirely.

Mr. LOSSEE.—I would like to ask Prof. Brown what he feeds his calves, when feeding skim milk, as a substitute in lieu of the cream?

Prof. Brown.—We are experimenting on such things as boiled linseed, molasses and oatmeal.

Mr. Lossee.—I am feeding boiled ground flax seed and oatmeal, but have never tried molasses, but believe it would be good. I am in winter dairying, having my cows come in in December and raising calves, and I think we will drift into this way and make butter right through the winters. Of course, we have got to have our barns good.

Mr. Harris was now called upon to read his second paper on "Hints on Cheese-making."

HINTS ON CHEESE-MAKING.

Address Delivered Before the Ontario Dairymen's Association by J. B. Harris, of Antwerp, N. Y.

It is now thirty years since the late Joseph Harding, of Somerset, was employed to teach the dairymen of Scotland the principles of the Cheddar system of making cheese, and the method taught by him is still in vogue in that country, only the people have retrograded in its practice, and of late years their products have not been as good as formerly.

There can be little doubt that this system, which took the place of the good old-fashioned Dunlap our grandmothers made, had been of great service to the country; but a feeling prevails that it is not meeting the requirements of the market. That this failure is owing to the faults of the system is not true, but it is attributable chiefly to the manner of its practice in most of the dairies. A want of a knowledge of the character of milk beyond what is visible to the casual observer on the part of the maker, leads to many an error, his position being much like that of one who has lost his way in a forest; he wanders on without knowing whither. Fine cheese have been made by the old system, but nineteen persons in every twenty fail. At any rate the people now realize the fact that the business has reached a point where it needs stirring up, and this the Scotch Dairy Association proposes to do.

Cheese-making has become a common topic of conversation: everywhere you go it is being discussed and theories and suggestions too numerous to mention have been written on the subject. But I doubt if there can ever be a code of rules laid down that will provide against all conditions of weather, etc. The maker must use his own judgment, and vary his practice to suit the conditions of the atmosphere and a hundred other external and internal circumstances.

In cheese-making as in everything else it is the little things which need looking after. "Take care of the little things and the great ones will take care of themselves" is as true here, and I had almost said truer than elsewhere; and I venture to say that a large part of the failures we meet with are due to what may be termed slight mistakes.

When we know how, it requires no more labour to make good cheese than it does to make poor, and it is far more profitable. Good cheese, well ripened is a valuable article of food, containing, as it does, a large per cent. of nourishment in an easily digested form. In fact, good cheese, when taken in the stomach promotes digestion, the action of the rennet being of itself a digestive process. Imperfectly cured cheese, on the other hand, is difficult of digestion, the rennet used in its composition never having broken down by digestive action the fibre of the curd. Such food can be disposed of only by the strongest stomachs, and is dear at any price.

Causes of Poor Cheese.

The causes which produce poor cheese are many, but I shall content myself by mentioning a few of the leading troubles with which makers have to contend.

First.—Some of the cows may have been out of health or eaten something prejudicial to the quality of the milk. Perhaps the milk may have been used too soon after coming in, or the herd may have had access to bad water, or the cows may have been worried or over-driven, causing the milk to spoil in the udder.

Second.—Filth breeds a numerous progeny of refractory and vicious consequences, all more or less far reaching in their power to do harm. The most scrupulous cleanliness is requisite in all the operations of cheese-making.

Third.—The cheese may be injured by setting the milk too deep or too shallow, because when set too deep the work of maturing goes forward too rapidly, and it is of the utmost importance that the milk reach and be not carried beyond a certain condition before the rennet is added. If, when this condition is reached, the rennet be applied at the nick of time, so to speak, the cheese is half made. This point the maker must learn to determine for himself, as it varies widely according to the character of the soil upon which the animals feed, and a variety of other circumstances.

Again, evil consequences may result from heating too high or not high enough, from the use of too much or too little rennet, from not cutting at the proper time, from scalding too rapidly, from drawing the whey too soon or not soon enough, from insufficient draining and over acidity, or from a lack of maturity, from miscalculation as to the quantity of salt used, and from mistakes in the time for going to press. The curing room may be over-heated, too cold, too damp or too dry. In short the name of the pitfalls that beset the cheese maker is legion, in any one of which if he be caught it will matter little that he has avoided all the rest.

From what has now been said it will be seen that the making of good cheese is not the result of chance, or a process likely to be hit upon by accident, but that experience based upon shrewd and systematic observation is alone to be relied upon.

Heat, rennet, salt, moisture, lactic acid, and the atmosphere, are the principal natural agents which must work together in the fabrication of good cheese, and the successful maker is he who knows how to preserve a healthful balance of power between them from first to last.

The office of rennet cannot be explained more definitely than to say that it is a law of nature that when mingled with milk it solidifies the casein or albuminous portion of that fluid, as the air solidifies the fibrin of the blood. This solidification is called coagulation. In the coagulation of milk the cream is held in suspensionand the whey expelled like the serum in the blood when that fluid solidifies. The function of rennet in curing is much the same as that of the gastric juice of the stomach, breaking down as it does the fibre of the curd and carrying it forward toward a condition like that of chyle in the digestive process of animals.

The purpose served by salt is to prevent putrefactive fermentation, give flavour, harden and regulate the ripening influence of the rennet. Moisture gives consistency. It has two forms, free and assimilated, the free separating from the curd and passing off either by pressing or gravitation, and the assimilated being taken up by the rennet and made a fact or in the texture of the cheese. Lactic acid seems to act as an auxiliary to or at least in harmony with rennet and helps to carry forward the various processes of change which occur in the lactic fluid, from the time when it leaves the udder until the final setting in of decay. At 98° heat seems to facilitate the action of all the other agents, but above that and up to 140°, it distresses and in fact arrests them, its influence being of a killing character. The following may serve as useful hints for the use of active chemical agents, with a view to produce the largest yield and the best quality.

For summer and fall cheese, use rennet sufficient to produce coagulation in fifty minutes with the milk at a temperature of from 86° to 88°. In the spring, while making fodder cheese, use one-third more rennet and less salt. The purpose of this is to facilitate the ripening process in order that the product may be ready for the market at the earliest day possible. To accomplish this result four ounces of Hanson's rennet for summer, and six for spring, with salt in proportion, will be sufficient. I speak of Hanson's rennet simply because I am accustomed to its use, and not for the purpose of advertising that commodity.

Experience has taught me that in two messes of milk produced on different soils, the conditions of heat and manipulation being the same, the cheese produced by the one when ready for market will be found to be more moist than the other. This I attribute to a constitutional difference in the milk, arising from a difference in soil, food and water. The maker having learned by experience the character of the milk in this particular, may

regulate the matter by variations in cutting, scalding and stirring. Having ascertained that moisture predominates in the milk of a given dairy, he will cut finer, scald more slowly, and stir longer, the reason being a common-sense one, that the smaller the cubes the more thorough will be the operation of heat upon them; the slower the scalding process the less likely we shall be to encrust the external surface of the blocks: and the more thoroughly we stir, the more certain we shall be to expel the moisture. Stirring should begin immediately after cutting, and should continue from ten to fifteen minutes prior to the application of heat, and should go on from thirty to forty minutes continuously, and perhaps ten more after the heat is withdrawn, the purpose of stirring after the removal of the heat being to prevent baking to the hot surface of the bottom. The original surfaces of the cubes should be carefully healed over by the gentle operation of heat, and remain intact during the whole balance of the process.

Heating should proceed slowly at first, but gradually increase as the whey separates. Ninety-eight degrees is the usual temperature in summer, but as the season advances the milk becomes richer, and in Scotland I found it necessary after a time to go as high as 102°. The heat must be kept up until the curd is matured and then cooled and aired well before salting.

Drawing Whey.

At the first indications of acidity, indeed at the very moment when it is knocking at the door, if I may be allowed the expression, and before it is admitted, the whey should be drawn. Right here lies the great secret of cheese-making: the absolute expulsion of the whey at the nick of time when acidity is known to be near and yet has not appeared.

After the whey is removed and while the subsequent stirring proceeds, a new acid makes its appearance in the body of the curd, which seems to depend for its development upon the action of the air, and the presence of which experience has shown to be an essential element in the make up of cheese. This acid should be allowed to develop properly before the addition of salt, as the presence of that system will preclude its appearance.

Curd should contain about thirty-five per cent. moisture when pressed, and dry out down to thirty-three per cent. when cured. To determine and retain this proper proportion of moisture in cheese is one point which requires good judgment in the operator, and can not be determined readily by any means now known of a practical nature. Observation and practice are the only guides at present known, and a cheese-maker must rely on his own experience and good common sense.

I might go on with a long list of practical hints embracing the whole subject of cheese-making, with strictures on a countless multitude of sins and shortcomings on the part of makers and patrons, but having on previous occasions expressed my opinion pretty frankly to this audience on these topics I forbear, not because of a failure on my part to recognize the value to be derived from the reiteration of valuable truths, but through fear less my remarks should partake too much of the sterility and barrenness common to all hackneyed and overworn themes. The temperance lecturer may find new words in which to express his thoughts, and may employ new figures of rhetoric with which to embellish them, but the old evils and the same staggering and abandoned bad examples will ever constitute the subject of his discourse. I will therefore conclude this paper with a description of what I call my tea cup test and the litmus paper test.

Everybody knows that a part of the process of cheese-making exactly coincides with a part of that process performed by the stomach in the digestion of milk: and it will be found that so far as this coincidence continues, the closer we imitate the action of that organ, the more perfect will be our work. When new milk is introduced into the stomach it is at once submitted to a heat of 98°. At the same time, nature begins to mingle it with gastric juice. This goes on until a chemical change takes place in the character of the milk, when coagulation begins and the mass becomes curd. Nature here as everywhere proceeds with unerring certainty in the performance of her work,

"For Art may err, but Nature cannot miss."

But man, as the poet intimates, with all his boasted astuteness is nevertheless at best a

bungler and must feel his way as one wandering in the dark, and in order to properly execute the laws of the Creator must ever resort to experiments to learn the way, as the navigator resorts to his reckoning as a guide on the pathless deep.

In the course of my business as a cheese-maker, I have not unfrequently found myself at sea in determining the condition of the milk upon which I was to begin operations, and so, to settle the question about which I was undecided, namely, the ripeness or maturity of the fluid. I had recourse to two tests, one of which was the use of litmus paper. This, as you know, is ordinary paper coloured with a substance sensitive to the action of acid, so that when introduced into any liquid containing acid an immediate change is produced in its colour. This test, however, is liable to mislead because of the fact that when sometimes used upon freshly drawn milk it will discover the presence of acid, when at the same time the milk will be found not susceptible to the action of rennet. Of course this phenomenon is due to the presence of carbonic acid gas, which evaporates after a time, and then the paper may be used with certainty: the difficult point being to know of a surety that the carbon has entirely disappeared.

The second test to which I had recourse was what I have been pleased to call the "teacup test."

When your milk is of that uncertain deceptive character that puts you at a loss, take an ordinary sized teacup, holding one gill, and into this full of milk introduce a dram or a teaspoonful of rennet of which you know the strength and then note the time employed to perfect coagulation. This will furnish you with unerring certainty with a knowledge of that of which you are in search. By the use of this test I was able to determine to a minute the time which would be consumed before cutting should begin. Moreover, I was able to produce some indications of astonishment among my Scotch pupils by informing them, after consulting my teacup, of the amount of time I should use in producing my curd ready for salt.

A word more with reference to the means I used to hastening the ripening process, and I have done.

When the milk was refractory and manifested a reluctance to come forward, the means I used to hasten its movement was heat. If in the morning I found the night's milk had descended to a temperature of say 66°, I ran up to 94°; if at 68°, then to 92°, my rule being to go as far above 90° as it had descended below 70°. Thus you see by a natural and salutary process I was able to dispose of my material at a seasonable hour, and was not compelled to resort to the baleful practice of introducing sour whey.

The Convention then adjourned at 1 p.m.

THIRD DAY—AFTERNOON SESSION.

January 16th, 1885.

The Convention assembled at 2.50 p.m. The President in the Chair. He said that, on the whole, the Convention had been very well attended, and the papers read had been quite as interesting as on former occasions. The Report will be more interesting, he thought, than any of its predecessors. It will be printed very shortly and be distributed long before the season commences for the manufacture of cheese, when all will have a copy of it and have an opportunity of reading it to digest the articles, and he trusted all would profit by the instruction it contained. It is only in this way that we could continue to make progress.

The Committee appointed to arrange for an amendment to the Act regarding the adulteration of milk now reported, having consulted a lawyer who drew up an amendment so as to make the Act effective. Mr. Moyer suggested that some clause be embodied in the Act so as to protect the butter-makers.

Mr. Ballantyne said if the resolution was adopted and left in the hands of the Board they would see that it was introduced into the House.

REPORT OF THE COMMITTEE ON AMENDMENTS TO "AN ACT TO PROTECT CHEESE AND BUTTER MANUFACTURERS."

Your Committee report that they are advised it is difficult to sustain a conviction under the provisions of Section 1 of the above Act, in consequence of the necessity of shewing a fraudulent intent on the part of persons supplying the impure or adultured milk, and they are of opinion said Act should be amended for the greater protection of cheese and butter manufacturers.

Your Committee are also advised that it is doubtful if the Attorney-General would recommend or sanction the introduction of a bill or an amendment to said Act with the view of lessening the weight of evidence necessary to procure a conviction for an offence under said Act, or to make the evidence necessary to constitute said offence any less than would be required for any other offence of a fraudulent character.

Your Committee would suggest that efforts be made to have the said Act amended so that an offence may be created by any person supplying milk of an inferior or adulterated character negligently or carelessly, or without the exercise of due and proper caution.

That said amendments should provide that in order to sustain a conviction under said Act it should not be necessary to shew that the person snpplying said milk should have done so with any fraudulent or wrongful intent, but that the gist of said offence should be the negligence and carelessness of supplying milk of an adulterated or impure quality.

That it should be sufficient *prima facie* evidence to constitute the said offence that the milk supplied by the person complained of should be found upon comparison with other milk supplied to manufacturers to be of an inferior, impure or adulterated quality, and that the test or mode of said comparison should be by means of the lactometer or cream gauge.

And that since the said Act was framed the cream-gathering system has been introduced which, under its provisions, does not protect parties engaged in that business, it is therefore also necessary to amend the Act in behalf of such parties, the framing of which will be got ready and embodied in this amendment when brought before the House.

That the manufacturers be at liberty to enter upon the premises of any person or persons who are suspected of any offence under said Act, and take samples of milk from the cows from which said supposed offender was or had been procuring said milk, without becoming trespassers.

That the only mode of appeal from convictions under said Act be to the General Sessions of the Peace for the county in which the offence was committed, and the remedy by Writ of *Certiorari* be taken away.

All of which is respectfully submitted.

ROBERT CLELAND,
Chairman.

Adopted.

Moved by L. Cleverdon, seconded by H. S. Lossee, and

Resolved, That the thanks of this Association are hereby given to the Mayor and Council of the Town of Stratford, for the generous provision of their comfortable Hall, placed at the disposal of this Association for the purpose of holding their Convention.—Carried unanimously.

Moved by Mr. Harris, seconded by Mr. Cassels, and

Resolved, That the thanks of this Association be given to the railway authorities for their generous reduction of railway fare to members attending the Convention.—Carried unanimously.

Moved Mr. S. R. Richardson, seconded by Mr. E. Caswell, and

Resolved, That a vote of thanks be given to those gentlemen who have been invited to prepare papers for discussion at the Convention, for the able and intstructive character of their papers.—Carried unanimously.

Mr. Ballantyne.—You are aware that two years ago we employed a cheese instructor. Previous to that Prof. Arnold had been engaged. It has occurred to us that in certain districts we may have some good makers who might be made use of in this capacity now and then to help in some of the other factories. What do you think of this? Does it meet with your approval?

Mr. Richardson.—Yes.

The Convention finally adjourned at 3.15 p.m.

DAIRYMEN'S ASSOCIATION

OF

EASTERN ONTARIO.

EIGHTH ANNUAL CONVENTION

OF THE

DAIRYMEN'S ASSOCIATION

OF EASTERN ONTARIO.

The eighth Annual Convention of the Dairymen's Association of Eastern Ontario assembled in the Music Hall, at Morrisburg, on Wednesday, the 4th February, 1885, at 10 o'clock a.m. The President, D. Derbyshire, Esq., occupied the chair, and opened the proceedings with an address.

THE PRESIDENT'S ADDRESS.

Mr. Derbyshire said they had again met in annual convention with the necessity which gave rise to the important organization still existing, that is, the necessity of more skill and better knowledge of our business.

Dairying more than ever is claiming the attention of the best thought in our country. Our advancement has been marked and rapid, resulting in the development of the power to think and to know, and by a comparison of ideas to establish knowledge.

At last the farmer has come to consider the importance of his high calling and his great responsibility in the framework of society.

When the generous soil of Canada refuses to respond to the husbandman's toil for a single season every spindle in our factories must cease to hum, the hammer must lay cold and untouched upon the anvil, and our steamships must lay idle in our harbours.

Agriculture, a giant in her relations to all other pursuits, has been underrated, and we know of no reason why she might not wield the most potent influences as she moves along with ponderous tread and commands the highest respect of all.

The traditions of our fathers still cling to us and exert an influence, unconscious or otherwise, over us in our habits of life. They made old-fashioned, high-salted butter, and kept it until it was not fit to eat, and in this respect they have many worthy successors. The earth does not yield its fruit as a duty it owes to man, or as a tribute for his want of knowledge, but it responds to the man who studies its capacities and administers its wants.

None have a higher mission than the farmer; he labours for his own prosperity, and, farmers, if you do that intelligently you labour for the prosperity of this grand Dominion of ours.

In opening this the eighth Annual Dairymen's Convention of Eastern Ontario, I think all will agree with me that we have every reason to be thankful for the very successful season which is now about drawn to a close.

I believe we did well in selecting this enterprising town of Morrisburg for this meeting. This is a splendid section of country in which the agriculturists are most successful, and we have come here to learn of them, and I feel like saying, "Come let us reason together, let us see wherein we have failed, and then devise a remedy."

From a personal knowledge I am glad to know that the teachings of the Association

are bearing good fruit, and that a large number of dairymen have adopted the advanced ideas of their most successful brethren, and it is to be hoped that their ideas and teachings will lift the farmers of this country to the high position designed for them by their Creator. They had made finer cheese in this section this season than ever before; and we hold an enviable position in the market of the world in cheese. But there is plenty of room for improvement: we yet have too many poor, leeky, miserable cheese made by unskilful hands which must be remedied before we reach that high point of excellence towards which we are rapidly approaching. If Mr. Bissell, Mr. Whitten and dozens of others can make fancy goods, why not have all made equally good? If Mr. McCrea, Mr. Bissell and others can make $60 a cow in the factory in one season, why can you not all do the same? We are living in an age of progress; goods that sold well even ten years ago, are unsaleable to-day. Our best customers require finer goods, and we must cater to their wants. Our production of cheese this year was largely in advance of any former year, and from the preparations now going on we are sure to even increase this year's large production with a tremendous make the coming season. I ask if, with an increasing make each year, you think there will be any chance for poor goods?

No, emphatically no; and if you wish to insure the sale of your cheese, you must shun poor makers and poor little struggling factories. Work your milk into the larger factories where the manufacturer has something to interest him in his business. Such a manufacturer will always hire the best men, and will have a proper building, well ventilated. Then furnish good milk, pay a good price for manufacturing, and you may expect a good article. In fact, you can then demand a first-class quality of cheese, and we are sure that if you or your patrons do all you can to aid such a manufacturer the result will be most satisfactory. I caution you against encouraging any man to start a small factory, if there is a large one within reasonable distance. You will find cranks who have failed in all they have ever undertaken who will say that they can make up their milk for one cent per ten pounds, but they are not to be trusted. No, it will pay in the end to stand by the old factory, to hold its name as sacred as your own, and with united endeavours we will be enabled to take and hold the foremost place in the great cheese industry.

Turning to the subject of manufacturing butter, I say we have to hang our heads in shame when that matter is mentioned. Why? Simply, because we cannot make fine goods? No, but because we positively refuse to place it upon the market after having made it, when it should be placed when it was in the best condition. We are obliged to sell our butter in competition with other countries, and while they place their make upon the market regularly every week or two, looking for buyers, we lock ours up and offer none for sale ten months out of the year. The result is that our butter is not in good demand, because these other makers have a trade established and have customers whom they supply and who will take their goods as long as the supply lasts, thus leaving ours until the last, and this year leaving it altogether. We have in Brockville section alone over 10,000 packages of butter, two-thirds of which is unfit for table use. Every creamery man who had made fancy butter for which he had been offered 25 cents per pound had held on wanting more, till now his butter is no better than very ordinary dairy. The reason why the butter business does not pay is because it has been mismanaged in not placing it on the market regularly when it was fresh and sweet. Other sections took advantage of this mismanagement and sold to customers we might have sold to. If the cheese men had acted upon the same plan our cheese would be mouldering away on the shelves. All this goes to show that we must keep pace with the age in which we live, or get out of the business, else we would be shoved out by our competitors. The Association has done everything it could to encourage and foster the manufacturing of a good and uniform article by sending the best men from factory to factory, and it is the intention to prosecute this work more vigorously than ever. As the Association is now constituted it has, besides a president and two vice-presidents, six directors to whom the speaker made most kindly reference, eulogizing them for the efforts they had put forth in the interests of the Association. He also expressed the thanks of the convention to the press of eastern Ontario for the courtesy shown the convention and for the aid and stimulus given to dairying, which owed much of its progress to the press. In conclusion he nominated the following persons as members of the Standing Committees :—

NOMINATIONS.—Messrs. Platt Hinman, J. Bissell and D. Vandewaters.
ORDER OF BUSINESS.—Messrs. D. M. McPherson, Platt Hinman and J. Bissell.
FINANCE.—Messrs. Ira Morgan, Henry Wade and James Haggarty.
DAIRY UTENSILS.—Messrs. J. Whitton, Howard Bissell and R. Wherry.
DAIRY AND IMPROVED STOCK.—Messrs. F. H. McCrae, T. Walker and James Haggarty.

These nominations were declared adopted.

Mr. McCrea said that such was the hearty appreciation of the President's address, that he felt called upon to move a resolution to the effect that it be printed in pamphlet form, and thrown broadcast all over the country.

A MEMBER.—In seconding the motion, I propose that it be done at once.

Mr. HAGGARTY.—The Annual Report will be issued at a very much earlier date this year, owing to the fact of the printing being done by Government, and thus, not only to those who have access to the daily papers will a knowledge of it be available, but to every member of the association. I therefore deem it advisable to defer the printing of the address.

Mr. MCCRAE.—The Report will go to only about one hundred, and it should go to a much larger number; every dairyman should have it.

Mr. ALEXANDER.—I am not favourable to having that address in pamphlet form, for the reason that it is a procedure not hitherto followed. Other members of this Association may deem it advisable to have their papers printed also. In this case the funds will not permit it. No doubt the importance of the several papers would suggest the propriety of giving to them the form of a pamphlet, if we could afford it.

Mr. HAGGARTY.—If we were to get all papers printed it would do away with our Association altogether. Let all addresses go out with the Report.

Mr. HENRY WADE explained that the printing would be done by Government, and very largely distributed, and that so far as expenditure was concerned, it would not cost anything to have a certain number of the President's address struck off if it were necessary.

After some further discussion the subject was allowed to drop, with the understanding that all papers would appear in the Report, to which every member was entitled—a book, as the President stated, worth $5 to every one.

THE SECRETS OF SUCCESS IN DAIRYING.

The first speaker called on was Mr. D. M. MCPHERSON, of Lancaster, who is a large cheese manufacturer. He said that the President's address just delivered was full of valuable information, and if properly acted upon would be productive of much good to the dairy industry. After a few other remarks, he stated that in some dairies they will average $20 a cow, some $35 and some $50. His experience in every case was that when $15 was averaged great dissatisfaction was expressed, but he strongly urged on the convention that they should aim to average $60 a cow, or 400 lbs. of cheese, or 4,000 lbs. of milk. His experience was that it takes $15 to maintain the expense of a cow, and it is no wonder that dissatisfaction is expressed. We all have a high aim, and when that high aim is obtained, we should still strive to further it. The speaker then said that cheese-makers should encourage the makers of butter and *vice versa*. He contended that with butter, when properly handled in every way, the profits were large. Morrisburg butter is quoted in the English markets and elsewhere, and is noted for its excellence. He maintained that it would be better for every dairyman to take a low price for his cheese for the first three months (6 to 8 cts.), and claimed that they would make a better average for five years than if they waited for prices to go up. He said that reference was made to large factories, which was indeed a very important point, and contended that dairymen should support the larger ones. One point which had not been touched on the speaker took up, and that was the proper feeding of the soil. He said that the whole secret in the dairy interests rested in not having a proper foundation. In the first place we must

secure a large amount of plant food for the products which we wish to produce. If the land has not the food to produce the grass, the cow will not be able to give that amount of milk that she would if the land had been in the right condition. He said that this was a question that should be taken up and discussed, as all depended upon the fertility of the soil. If you can't get grass you can't get milk, and if you can't get milk you can't get cheese. Being asked if the cheddar cheese seemed to be the favourite to-day, and if they had received good value in cheese during the year, Mr. McPherson said that he had been in the cheese business fifteen years, and that the last four years had given the best average since he had been in the trade. The great secret in manufacturing cheese was to make a good article, and market it at the proper time. When a farmer gets eighty cents a hundred for milk it pays him well, and we can count on that for twenty years to come.

Mr. HINMAN.—With regard to yield, is it in soil, in quality of land, or location?

Mr. MCPHERSON.—The difference of returns lies in the fertility of the soil. If you don't get grass you can't get milk. Putting the soil in proper condition and plowing in the most approved manner cannot fail to bring its own reward. Farmers who have lots of cows on poor land cannot expect to get grass.

Mr. HAGGARTY.—Too many cattle on a small piece of land has the same effect?

Mr. MCPHERSON.—No doubt.

Mr. ALEXANDER.—There is something in raising the cattle. What breed of cattle do you find the best?

Mr. MCPHERSON.—The best pedigree you can get of a cow is the number of pounds of milk she gives daily. Fifty to sixty pounds of milk is the best pedigree I can get.

Mr. MCCRAE.—There is something due to the milking. The way in which the cow is handled, driven and milked?

Mr. MCPHERSON.—Yes, a large amount.

Mr. HAGGARTY.—Much blame should be attached to our cheese buyers. They take advantage of us. I notice that whenever cheese takes a rise they run out to us in the night and buy our cheese for less than we could really get for it. We want men to give us fair, honest prices—all that they can afford to give us.

Mr. MCPHERSON.—If a man goes after dark, and you are not up, don't sell.

Mr. ALEXANDER.—The system of getting too much of one quality of cheese is going to be a serious matter in future. For instance, the manufacture of cheddar cheese throughout the whole country would result in a lack of variety.

Mr. BISSELL.—We have a variety.

Mr. MCPHERSON.—Very happily, the cheddar cheese seems to be the cheese of the country. The maker on the English market who comes nearer to that standard gets the highest price. In reference to the manufacture of different styles of cheese, besides those of the cheddar, the Stilton, Gloucester, Wiltshire, and other brands of fancy cheese, there is only a limited demand. We cannot as dairymen expect to go into and develop a large trade in the direction of this fancy cheese. Men who have small factories, favourably located, will turn their attention to fancy cheese. Our aim should be to obtain that fine, close, silky texture, mild in flavour, and then get the goods into the hands of the consumer in its best possible state. There is a certain stage at which to do this; from six to eight weeks old (for our cheese) when it breaks down and shows its quality. Other classes take longer, but the general run requires about this number of weeks from the time of manufacture till it reaches the consumer's hands. Mildness of flavour encourages large consumption. When held from eight to ten weeks or three months, it gets off flavour, strong, and rancid. Of this latter class, the labourer in England would use only from two to three ounces, while of the former he would in all probability consume from six to eight ounces. Some buyers prefer a little softer and others a little firmer article, but these will call for special customers.

Mr. DERBYSHIRE, the president, after complimenting Mr. McPherson on his excellent address, said that in Brockville district cheese factories were being erected hardly a mile

apart, which he did not approve of. He urged on the convention the advisability of patronizing large and old established factories. When a man puts a brand on cheese, and then *steals* in cheese that are inferior in quality he is going to be found out. That man's name and the name of that factory are never forgotten. This matter should be looked after particularly. There will be a few cheese made of that character, arising from milk received in poor condition during the hot weather, but the brand should never be put on them. Let the boxes, brand, etc., go in the best possible shape. We want the people of Liverpool to know that we are producing the finest stock in the world—giving sixteen ounces to the pound—and if they want 5,000 boxes, we can send them in a few hours. They are sure to give satisfaction if we send as we should—of a uniform quality, etc.- Such goods will work off the buyer's hands, he'll cable for more, and no mention made of prices at all. The price to sell at is in your own hands. This association has met for the purpose of making a uniform quality to suit consumers there, and force them to require our goods.

Mr. MACPHERSON.—Send forward the goods. As a rule we have done so, but there is a half-way house where they may be detained. If the dealers insist on our sending forward, we insist it shall go forward without stopping at this half-way house.

The Convention resumed at 2 o'clock, President Derbyshire in the Chair, when Mr. M. Cook, of the firm of Lord, Cook & Sons, of Aultsville, read a paper on "Holstein Cattle :"—

Mr. President and Gentlemen of the Association—I would ask your pardon for attempting to occupy your attention for a few moments : but we are all gathered here in one common cause, and that is for the mutual instruction and improvement of the dairyman and his interests. We all have our friends, our theories, and our favourites. Some are here to tell you of methods, new and old, whereby the most butter and cheese can be obtained from a given quantity of milk. Some are here to instruct you as to the most appropriate crop to grow, and the most practicable method of feeding it whereby to accomplish that desired end. Others are here to advocate the merits and sound the praises of that animal or breed of cattle which will most surely bring forth the most favourable results, with the most improved care in feeding and manufacture. But practically the economy and wants of the dairyman do not stop here. Another qualification must be met ; although the quality and quantity of milk, the excellence and amount of butter and cheese be far above the standard, still another requisite in the dairy cow is asked for, and that is the facility for laying on fat when worn out in the dairy and thus becoming merchantable as beef. Thus, to be profitable to the dairyman, he should select such animals as would be hearty feeders, to withstand the rigours of our winters ; heavy milk producers, so as to meet the demand of the pig-pen, as well as the young calf ; second to none in the yield of butter and cheese ; and finally, when the dairy mission is complete, to be able to furnish the market with a suitable article of beef.

In calling your attention to this subject we justly point with pride to the large butter yield of the little Jersey : but, should an accident befall her while actively serving her purpose in the herd, or should she become worn out in the service of the dairy, her small size and light weight render her of little value in the fat-stock market : while, what is left after taking the cream from her milk scarcely supports her calf. The noble Ayrshire gives us her full complement of milk, butter and cheese, but she, too, is deficient in size, and so by the butcher is passed by. While the proud Durham, Polled Angus, and Hereford, each have their favourites in the slaughter-yard, yet they utterly fail in the milk and butter qualities in which the Jersey and Ayrshire excel.

But, some one says, could not an animal be bred by a fusion of the best strains from each of these families and so develop all the essential characteristics of a general purpose cow ? We answer *yes*, it could ; it has already been done, and done with very gratifying success. The highest point of perfection arrived at so far has been reached in the Lowlands of Holland ; and the most flattering marks of attainment have been demonstrated

in the Holstein family, which fact, until a very few years since, has been regarded by many as purely mythical. Until two years ago the Holstein cow was a stranger to Canada, but for the past fifteen years she has been an attractive feature among the dairymen in the United States. Her achievements in the dairy are wonderful; and her failure as a general purpose cow is yet to be recorded. She comes to us from across the water as a large, well formed black and white cow, with sometimes the white and sometimes the black predominating; small fine head, smooth skin and soft glossy hair. The experience of importers and breeders in the neighbouring States proves conclusively that they acclimate easily, and successfully withstand our rigid winter climate. They are very hardy, excellent feeders, thrive on coarse food, are rapid growers, mature readily and make an exquisite quality of beef. In Holland their beef qualities are as marked as is that of their milk. In disposition they are quiet and docile, and if handled much they become perfect pets. In weight, heifers one year old often tip the scales at 800 lbs., while mature cows run from 1,200 to 1,800 lbs. Their famous milking qualities have given them a world-wide reputation as milk-producers, and several now in this country have records of upwards of 100 lbs. of milk in a single day. The famous cow "Echo" leads the list for the year with 23,775 lbs. Suppose that "Echo's" milk had been sold at the factory for $1 per hundred, there would have been realized for the year $237. No person has ever disputed their claim of being the greatest cheese producers in the world, as they come to us fresh from the land of cheese. But their entrance into this country has opened up a new field whereby to test their excellence.

The butter-field has been cultivated and brought to a high state of perfection through the Jersey; and now the Holstein is asked to compete with her in this sphere. What is the result? We find that while the "Jersey Mary Ann," of St. Lambert's, carries off the laurels in a single week's test: nevertheless the largest yield of butter ever credibly recorded as having been given by a single cow in a test of 30 days, was given by the Holstein cow "Mercedes," the quantity being 99 lbs. 6½ ounces, thus winning the championship of the world. In this test is shown clearly another strong characteristic of the whole family, viz., the power of endurance or holding out, as they milk very evenly throughout the year, it being sometimes difficult to dry them off so as to give rest for the next season's work. Already scores of these cattle are making and have made butter records of from two or three lbs. per day for several days in succession. We have them in our herd which have done it without any extra strain, and we feel confident and assured that this is but the beginning of many grand achievements yet to be recorded by the members of the Holstein family.

Now, lastly, with reference to their beefing propensities, these animals when not milking and in a condition to be fed for beef, increase in weight very rapidly; they have the size, and assimilate their food well. Mr. Powell reports "Rugby Prince" as gaining 148 lbs. in 21 days, an average of seven lbs. per day, while Mr. Wales reports "Jasp-4th," as gaining, when eleven months old, five and half lbs. per day for thirty consecutive days. Other instances just as good are reported; in fact, in Holland they are noted as much for their excellent beef as for their milk. Mr. Dudley Miller, of Oswego, whose official position makes him thoroughly familiar with the subject, says: "This breed of cattle imported from Holland, which is attracting so much attention, is remarkable in that it is profitable first as a milk producer; second, for the manufacture of cheese; third, for butter, and last but not least, for beef. These four paying qualities are possessed by the Holstein breed to a greater degree than any other, which has been clearly demonstrated by men who have bred it with perseverance and intelligence." They cross well with the various other breeds, and produce an excellent grade with our native cow, imparting to their offspring generally the colour-marks and milking qualities of their Dutch ancestry; and to the farmer who cannot afford to invest much at first, the grading process is commendable. To cite an example, we might refer you to the manner in which Mr. S. N. Wright, a successful dairy farmer of Elgin, Illinois, started a herd of Holsteins. "This gentleman's herd of cows were natives with an admixture of Shorthorn blood, and he obtained the service of a full blood Holstein bull, and continued the service of that blood until now he has as fine a herd of cows as can be found in the Elgin district. He started with a good sire and now can show the results. During the eight or ten years he has been building up his herd

he has sold annually enough to pay the first cost, and what he has done can readily be repeated by any one who will devote time and intelligence to the work. Grading up is a rapid process if we use thorough-bred males, but a very slow and often retrogressive process if we attempt it, like many of our farmers, by the system of in-breeding. One very important and perhaps the all-important point in the selection of a male is the record and performances of his ancestors. This history in the grade is often doubtful, or perhaps guesswork; but in the full-blooded or registered stock one has but to refer to the pedigree to get the fullest information of his ancestral lineage, so that all doubts at once are set at rest; a certainty is more likely to be procured, and a high state of perfection the sooner reached.

Our object in throwing out these suggestions is to arouse and lift our fellow-dairymen out of the routine path in which their fathers long ago trod; to help them see how they can the better help themselves; and to quicken and stimulate their energies and ambition so as not to be outrivalled by their keen, far-sighted American neighbours in the adoption and development of that general purpose cow *par excellence*, the Holstein. Finally, in a word, it is with a pardonable pride that we refer to our own introduction of these cattle to the dairymen of Canada, little more than two years since, when we imported the nucleus of what is now the finest herd in the country. Since then we have sent out representatives of our stock, including several small herds, into almost every Province, and we have yet to learn of any failure to meet the requirements placed upon them. Our faith in their mission to become the cow by adoption grows stronger with every experience, and our each day's experience with them more fully corroborates the most glowing performances individually and collectively of the Holstein family.

Mr. McCrae (Elizabethtown), said he had some experience with Holsteins and had found them all that had been represented. He was sure they were just the breed required for the farmer of Canada. He had one Holstein heifer which, when 22 months old, had given 62 lbs. of milk per day through May and 25 lbs. through December. The feed during May had been four quarts of ground oats and bran, besides her grazing. A great deal of prejudice existed against the Holsteins, which he was sure would be dispelled if a more careful study of their qualities was made.

Mr. Shaw.—I would like to ask Mr. Cook what age was that steer which made a gain of seven pounds per day?

Mr. Cook.—Mr. Powell does not report the age. It is considered good gain to make three pounds gain the first year. There may be circumstances that would enable a person to make a gain of more.

Mr. Haggarty.—I would like to know if there is any difference in the milking properties of the Holsteins with regard to families of milkers? In Ayrshires some families are very poor milkers, and have been condemned on that account.

Mr. Cook.—They are like all other breeds—some good and some indifferent.

Mr. Allison.—How many pounds of milk to make a pound of butter will do for each cow per week?

Mr. Cook said that 15½ pounds had been known to do it, but it had also taken 25 pounds.

Mr. Ashley.—At what time of the year?

Mr. Cook.—In the fall.

Mr. Macpherson.—Any additional food besides the grass?

Mr. Cook.—A little more; two quarts at night and two quarts in the morning.

Mr. Bissell.—What kind?

Mr. Cook.—Peas, oats, and a little bran mixed.

Mr. Moody asked how breeders were going to get their money back when they had invested in one of these Holsteins, and then in a few years the breed depreciated and some other superseded it?

Mr. McCrea said he had invested in a Holstein bull and the first year had sold more

that double enough of half-breed calves to pay for him, besides having twenty-five of the best calves left for his own dairy. Milking the cows will bring the money back.

Mr. Moody.—It would be a difficult matter to make a hard-working farmer, who has had to make his farm out of the bush with his axe, see that point.

Mr. Cook.—How is it possible to improve stock unless he gets a thoroughbred?

Mr. Moody.—He might get it, but if he were to pay all that he had it would swamp him.

Mr. Moody asked what was the relative cost of the food given to the Holstein and other breeds to produce beef.

Mr. Cook said he could not give a definite answer to the question, but the Holsteins were represented and had proved themselves capable of giving the largest returns in beef for a given outlay.

Mr. Macpherson.—Improved stock is not sufficiently appreciated. Men who have invested in an improved bull have never lost a dollar on it. Some three or four might club together to purchase an animal and have the very best cows by raising stock from that source, thus improving it in a large circle.

Mr. McCrae.—That's just what we are assembled here for, to find out how we are going to accomplish those desired ends. Men are willing to pay what a cow is worth, hence we want to raise a breed of superior dairy cows.

Q.—What amount of gain in weight has been made on a Holstein calf in three months?

Mr. Bissell.—We purchased a bull from Mr. Cook which cost us nearly $400. We were well patronized, several farmers giving $10 for the service of the bull. We made on 45 cows, besides our own, $450 gain. My uncle had a calf dropt on the 18th November weighing 82 pounds. After running with the cow two weeks it weighed 127 pounds. The cow being sold it was then fed in the pail, and at the end of sixty days it weighed 263 pounds; at sixy-nine days old, 296 pounds, and at seventy-six days old, 328 pounds. Thus you will see that in seven days it gained over four and a half pounds per day, gaining from 296 pounds to 328 pounds in the last week. The feed was new milk.

Q.—What quantity? A great deal depends on that.

Mr. Bissell.—All that he would drink.

Mr. Ashley.—In regard to buying an animal, there are farmers who have not money enough to pay for one. If all of you raise them, you cannot get the prices spoken of. There is only a certain class of men who can raise and breed cattle at those prices. They of course should be well patronized. As a suggestion, I would mention the fact that there is a way to get these animals for less money. We have an association now. Let the people who are interested in this matter come forward, select a gentleman, and send him to Holland. Parties in York State have done so. You can manage so as to enable those who are not financially situated to pay high prices to get them cheaper. The poorer farmers should be enlightened. Some of them have not paid for their farms, and are afraid to invest a dollar. A few men can succeed with these animals because they can afford to put large sums in the venture. Select a man, therefore, and let him bring over a herd. It will cost very little, they will sell five to one, increase the trade very largely, and thus become very much cheaper.

Mr. Bissell.—The poor people patronized us, and they sell those grade calves at $125 a piece.

Q.—At what age do they develop milking qualities?

Mr. Cook.—At two years of age. The more people become acquainted with them the more we can sell.

A Member.—My experience of grade Holsteins has been such that I hold a very poor opinion of them; having raised five, only one out of that number, with respect to milking qualities, was worth keeping.

Q.—Have you raised from Ayrshires?

Mr. Cook.—We have not that class of stock.

Q.—Where the white colour predominates, is it a sign of good milking strain?

Mr. Cook.—It is a matter of taste with breeders; some would like more white than black, and others more black than white. It has no effect on the milk.

Possibilities of the Dairy Cow.

The President then introduced Mr. Shaw, of Hamilton, editor of the *Live Stock Journal*, who, after referring to the excellent quality of butter manufactured in Morrisburg, read a paper on the "Possibilities of the Dairy Cow." This paper is given in the report of the Western Association's Convention, page —.

Mr. Moody.—While appreciating the very nice essay of Mr. Shaw, I had hoped to hear something definite as to the method by which the dairy cow might be improved. Doubtless the practice of keeping a record is a very needful one. It is a matter of fact that the ordinary farmers who have cows not paying for their keep do not keep a record. A great deal of the contention and confusion of opinions arising from the defects of the different breeds is the direct result of attempting to do too much. No one will deny that much good has been achieved by men making themselves specialists in their stock. The results are patent to all. The country is developing at that rate which calls for such breeds of cattle, but higher results will not be attained by attempting to get a cow alike suitable for the best butter maker and the best cheese-maker at the same time. Their conditions are not compatible with each other. A good deal of contempt and warm feeling exists because of the attempt to bring forward any special breed for all purposes. It would be desirable if a common farmer could do so, but it is hopeless to look for it. Let this district decide by experience what cow makes the most cheese, and confine themselves to that class. The argument brought forward that a cow is good for beef after cheese and butter is not a good one; her beef would not pay. It should be much larger, as a rule, before the dairy interests would cause any farmer to buy a cow for dairy purposes which would turn out big beef.

Mr. Bissell.—In regard to that matter many things may be said in connection with cattle interests and farming interests, because it has not been absolutely determined as yet whether it would be wise to try to attain highest results of milk and beef in one animal or not.

Mr McCrae.—The yield of cows is a question of great importance when taking into consideration the difference of yields made. It has been amusing in looking over the books and returns to puzzle out the rotations of different in-breeds. Some produce as high as 45 and 50, even to 62, and as low as 20 pounds per day. When we look at such returns we know there must be something wrong. Different causes arise to affect the yield. We find men sometimes feeding ten cows, amongst which there will be an average of age from two to eighteen years: some of them wintering out, and others being fed on pea-meal, and a number of them coming in from February to August. They are either milked at seven or eight o'clock in the morning or not till after dark. The owner is hauling wood to market or is busy with his tools, while the cows are out and left to be milked by his wife, the children, or anybody else, as good luck or chance may arrange it. They are milked one morning at five o'clock, and again after he comes from his work. All these causes affect dairying, and no wonder that that man has to go and look for some other means of livelihood. We find him selling cheese for eight cents per pound. (Laughter.) On the other hand, visit the thrifty, well-to-do farmer, and you will find his cows standing in a nice warm stable, up to their knees in clean straw, with a thick coat on, and nice, good flesh. Just at such an hour he is prompt to be at the stable feeding both night and morning regularly. To speak from experience, starting as a young man, I had to make my money as best I could. I went on a farm, paid $450 rent, came across a good stock and invested, and I have realized $650 with my cows. My cattle have never been neglected, and never left out in the snow to freeze: they have been curried,

their tails combed out: they have been fed and watered, and put in their stable, and milked punctually every day. I have had hired help who would take offence because of not being allowed to milk out of season as regards the hour.

Q.—At what hour do you do the milking?

Mr. McCrae.—About six o'clock in the morning and six in the evening, with slight variation.

Q.—How about the feeding and managing in the summer?

Mr. McCrae.—Very little meal and bran in the summer.

Q.—How many cows do you milk?

Mr. McCrae.—One hundred cows.

Q.—How do you treat dry cows in the winter?

Mr. McCrae.—In different ways. Hay once a day, and new oats lightly cut on the green side, not thrashed at all. The cheapest and best way is to feed twice a day. My cows are of all breeds, but the best are Ayrshires. They were principally all bought: very few were raised excepting the Holsteins. I propose to raise a better cow that I can buy in using our thoroughbred Holstein bull.

Q.—How do you fasten the cows?

Mr. McCrae.—We use stanchions.

Q.—What amount of land do you use for green fodder, either in oats or corn?

Mr. McCrea.—In some seasons we don't fodder until October. We raise clover and cut early.

Q.—What acreage per cow for pasture?

Mr. McCrae.—Three acres to the cow. I feed twice a day.

Q.—Do you find your land improving?

Mr. McCrae.—Yes; I can keep more stock.

Q.—Is it permanent pasture?

Mr. McCrae.—It is not.

Q.—What kind of water do you supply?

Mr. McCrae.—Spring brook.

Mr. Macpherson.—Is it not possible to feed cows on one acre per cow?

Mr. McCrae.—I am experimenting with all grasses. My opinion is that we can.

Q.—Could you keep as many cows on clover as you could on natural grass?

Mr. McCrae.—Think you could, and more if it were well put down through the season. Orchard grass will beat any other.

Q.—What kind of clover do you grow?

Mr. McCrae.—Alsike, with mixed grasses. I have seeded Lucerne for the first time, but have heard that it would not stay the first winter on clay land. My orchard grass headed out a good deal before the snow came on it.

Q.—What kind of soil have you?

Mr. McCrae.—All kinds.

Q.—Do you mow your grass, or seed in the spring?

Mr. McCrae.—I seed with oats and have a fine catch.

Q.—What kind of land do you sow with the orchard grass?

Mr. McCrea.—On good high land. It will grow on moderately low land, but not on wet land.

Q.—Do you find grade Ayrshires docile?

Mr. McCrae.—If they are handled rightly, yes: there is a great deal in handling.

Mr. Howard Bissell, of Brockville, instructor for Eastern Ontario, then gave his report as follows :—

MR. HOWARD BISSELL'S REPORT.

To the President and Directors of the Eastern Ontario Dairymen's Association.

Gentlemen,—It is with pleasure I submit to you my report as Cheese Instructor for 1884. I commenced my work on May 19th at Maple Grove factory, Algonquin, and finished on the 10th August at the Roseville factory, as follows :—

Factory.	Proprietor.	Address.
Maple Grove	A. Bissell	Algonquin.
Leeds Union	Joint Stock	Lyn.
Lilly Spring	"	"
Leeds Centre	"	McIntosh's Mills.
Fairflax	"	"
Maple Grange	F. H. McRae	Spring Valley.
Glen Buell	J. C. Gilroy	Glen Buell.
Archer	— Tracey	Aultsville.
Aultsville	— Sweet	"
Pleasant Valley	J. L. Holister	Osnabruck Centre
Farran Point	J. S. C	"
Kilburn Spring	McRae & Fields	
Frankville	"	
Anvern	A. C. Johns	Fairfield East.
Ager's Combination (No. 7)	Willliam Ager	South Mountain
Shanley (No. 4)	"	"
South Mountain (No. 3)	"	"
No. 10	"	"
No. 1	"	"
Thompson Combination	A. Thompson	Pitston.
Dixon's Corners (No. 3)	"	"
Lord Dufferin	M. K. Hunt	Lyn.
Iroquois	D. G. McBean	Lancaster.
Greenbush	Thomas Smith	Greenbush.
Gloss B.	Robert Barlow	Addison.
Plum Hollow	Joe Knapp	Plum Hollow.
Central Augusta	J. S. C	Algonquin.
Roebuck	"	Roebuck.
Lorne	Miller & Ferguson	Spencerville.
Spencerville	"	"
Kemptville	A. Murphy	Kemptville.
Oxford Mills	M. Gair	Oxford Mills
Bishop's Mills	Alexander & Bro	Bishop's Mills.
South Branch	Thomas Meach	N. Augusta.
Farmersville Full Cream	S. Williams	Farmersville.
Farmer's Own	James Barlow	Delta.
Phillipsville	J. Alguire	Phillipsville.
Lynhurst	J. S. C	Lynhurst.
Spring Vale	W. W. Hicock	Sweet's Corners.
Washburn Full Cream	L. Washburn	Delta.
Golden Spring	A. Wilson	Farmersville.
Golden Glow	Horton & Stacey	N. Augusta.
Collins Bay	Peter Grass	Collins Bay.
Glenvale	Jos. Crammer	"
Elginburg	Thomas Gess	Kingston.
Glenburnie	Robert Vair	"

Factory.	Proprietor.	Address.
Victor	Alexander Thompson	Mallorytown.
Excelsior	J. Davidson	Brockville.
Star	Norman Fields	Lyn.
Mallory	A. Mallory	Mallorytown.
Mallorytown Union	J. S. C.	"
Escott	W. F. Hughes	Escott.
Holland	J. S. C.	"
Junetown	"	Junetown.
Canetown	"	"
Silver Spring	"	Lyn.
Wright & Co.	Wright & Co.	Charleville.
Delta	— Bresee	Delta.
Dominion	E. V. Holliday	Elgin.
Elgin Union	J. S. C.	"
Maple Grove	S. Holliday	"
Rockdale	Chipman & Dargavel	"
Clear Lake	J. S. C.	"
Cherry Ridge	J. Knolton	Newborough.
Singleton's	Myres & Singleton	"
Forfair	"	"
Ardmore	D. P. Alguire	Westport.
Salem	"	"
Fermoy	"	"
Portland	Thomas Ripley	Portland.
Rogers	Alex. Rogers	Newboyne.
Silver Creek	A. B. Coad	Toledo.
Sixteen factories of Allangrove Combination	D. M. Macpherson	Lancaster.
Riverside	Matheson & Publow	Perth.
Mississippi	"	"
Dexter	Donald McPhail	"
Drummond Centre	U. L. Empy	"
Balderson	J. S. Co.	Balderson's Corners.
Boyd	Thomas Willis	Carleton Place.
Fairplay	J. S. Co.	"
Hopetown	"	Hopetown.
Fallbrook Mutual	"	Fallbrook.
Harper's	"	Harper.
Bathurst Mutual	"	
Roseville Mutual	Strong & Clark	Roseville.

This makes one hundred factories, but as fifteen were visited twice it makes one hundred and fifteen visits in all. Thus you will see that it kept me moving, and not much time to lose. I reported for 1883 as to quality twenty fine factories out of a total eighty. I can report fifty-fine out of one hundred for 1884, and a great improvement otherwise.

I found only one factory soaking rennet in whey and ten with tainted rennet for 1884, against ten soaking rennet in whey and twenty using tainted rennet out of eighty factories in 1883, leaving eighty-nine factories out of one hundred with good pure rennet or rennet extract in 1884. I am sure this is a great improvement, and I think Professors Arnold and Harris will endorse this as far as the rennet goes.

The poorest class of cheese I found was in the county of Frontenac—sour, puffy, pin-holed, cracked, and bad flavour—caused by tainted rennet and milk. Mr. Whitton and myself met in the city of Kingston, July 3rd, and made cheese together in Collins Bay factory. We received some very poor milk, but turned out some very good cheese. Mr. Whitton is a man who understands his business, and I was glad to meet him.

I will mention here that the western part of my division is far behind the eastern. Mr. Macpherson, of the Allan Grove Combination, is sparing a great amount of time and money to educate his makers to turn out a fine article, and is employing competent men to instruct them. These men are constantly on the road—W. McLeod, general superintendent, and J. A. Ruddick, of Ingersoll, on the south side of the river, and W. C. Dickson on north side. I compliment them on their success. Mr. Macpherson allows no bad cheese to be palmed off on the buyers. There is an extra mark put upon goods which are inferior in quality, and these are sold on their merits.

I claim, Mr. President, that the factorymen of Brockville section should adopt this plan of culling cheese on the shelves, and not in Montreal. I think, sir, if this was adopted for one season there would not be such weeping, wailing and gnashing of teeth as there was this past season upon the part of buyers and factorymen. I hope there will be some standard to go by this coming season. I do think if this plan was adopted generally much good would be accomplished.

I might here say a few words on my method of cheese-making. I have been experimenting during the past season to make a white, "meaty" cheese as desired in the Liverpool market. I accomplished this to a certain extent, as follows:—Set at eighty-six or eighty-eight, depending on the condition of the milk. If a little old, shewing signs of acid, set at eighty-two and hurry the process at every stage, and cheese-makers must understand condition of milk before using rennet, as any practical man will. Stir the milk five minutes after shutting off steam. Use enough rennet to show signs of coagulation in ten minutes in spring and fall, and fifteen in summer months. Stir rennet in thoroughly from three to four minutes. Now, with the bottom of the dipper occasionally stir carefully the entire surface of the vat to the depth of one to two inches, until coagulation begins. The purpose is to keep the cream from rising to the surface. When the curd is firm enough, splitting clean before the finger, the work of cutting should begin. Cut first with perpendicular knife lengthwise, then across and finally with horizontal, not waiting for the curd to settle, as some makers do. Stir with rake or hands very gently at first for five or ten minutes. Turn on steam slowly at first, constantly stirring to keep from matting. Heat to ninety-eight or one hundred degrees. Stir for five or ten minutes after shutting off steam, and if globe valve leaks steam pull off rubber to prevent curd from burning on the bottom of vat. Spread covering over top of vat to retain the heat. If curd very sweet, renew heat. When sufficiently cooked compress a quantity in the hand: it will show a certain degree of elasticity. When this condition is reached it will be time to draw off the whey. Spread curd thinly over bottom of vat and when sufficiently matted cut four drains—one on each side and two in the centre, for the whey to drain if curd is sweet and in good condition: if not, stir with the hands after running off whey, breaking up two or three times. This has a tendency to harden curd and expel moisture. Cut in small pieces and turn over, leaving the drains clear for whey to escape. Cover up, and to keep warm add a little steam under the cover with hose. Turn curd every fifteen or twenty minutes. Keep curd in this position till it will break down and flake nicely, and has a smooth, velvety feel. If free from taint grind and salt two pounds in spring, two and a-half in summer and two and three-quarters in fall, hauling up each side with drain in centre for brine to drain off. Let lay in salt from two to three hours till curd is properly matured. My reason for so doing is that the curd will press together much better, leaving a nice fine rind on face of cheese and not so apt to crack.

When ready for press fill up all hoops that will be required for one vat and put to press at once, tightening slowly at first, and following them up often. Bandage in one hour, pull up bandage and fold over edges neatly. When sufficiently pressed take them out and remove to curing-room at once, not leaving them on press boards for half a day, as I have seen done. Have shelves clean, grease on both ends, and rub well with palm of the hand. Turn them every morning before milk comes in till ready to ship. Take pains in boxing: have boxes cut down to fit cheese, adding two scale boards for each cheese. If cheese-makers will try to follow this method I am sure they will be successful.

Duty of Patrons.—First, a patron owes it to himself directly to improve his stock. Any man knows that it costs just as much to produce the milk of a poor cow as it does

that of a good one, though the difference in quantity of milk may be fifty per cent. The course to be pursued is a very simple one. Breed only from cows of a milk-giving strain, no matter if they be thoroughbred or grade. He also owes a duty to the manufacturer directly and to himself indirectly in the matter of sending his milk to the factory in good condition. Let him be sure that his cans and milk-pails are properly washed and scalded, exercising the greatest cleanliness in milking, and very careful where the milk is left standing over night, that there are no foul odours to come in contact with it, for it is well known that the fats in milk have a peculiar affinity for all such. These are oft-repeated words, but judging from the short memories a great many people apparently have in this matter, I think it is well worth repeating again. The above mentioned is one of the causes of the great evil, "tainted milk." Something must be done to eradicate this evil, and a great deal is being done, but the desired effect cannot be obtained without the hearty co-operation of the farmers.

I hope the day is near at hand when we will have no more complaints about imperfect or impure milk, *i. e.*, skimmed or watered, which has been so common this last season. A great many patrons are so greedy for gain that they will make thieves of themselves by taking off cream, rinsing their pails, and adding the water to the milk. Such is to my mind the meanest kind of a theft; the man guilty of it actually steals from every patron in the factory, and should be punished to the utmost extremity of the law.

All of which is respectfully submitted.

Having finished my work with the Dairymen's Association of Eastern Ontario for the season, I was engaged by Messrs. A. A. Ayer & Co., exporters of butter and cheese, of Montreal, to try and improve the make in the Province of Quebec. I found great room for improvement, nearly every factory soaking their rennets in whey, and only an exceptional factory making on the cheddar principle. I am perfectly surprised that they are making as fine cheese as they are on their methods.

I find that their milk is fully equal to that of the Brockville section, and by working on the cheddar principle and buying liquid rennet, they can make as fine cheese as any people in the Province of Ontario. I would strongly recommend every factory securing at once a curd mill and commence to cheddar; not soaking their rennets in whey but in water, or, better still, buy the rennet extract. Then the cheese of Quebec will advance thousands of dollars, the money going directly into farmers' pockets. Gentlemen, give my system a trial and you will be satisfied.

Respectfully submitted.

HOWARD BISSELL, Instructor E. O. D. A.

Q.—How do you cure cheese taken from the hoops?

Mr. BISSELL.—Several factories use bandage cloth, but I prefer to grease, because you get a better rind.

Q.—What temperature to heat milk?

Mr. BISSELL.—Heat from 98° to 100°.

Q.—Why heat more at one time than another?

Mr. BISSELL.—It depends upon the weather.

Q.—What causes gas in the milk?

Mr. BISSELL.—Several reasons, one of which would be imperfectly airing the milk, and another, uncleanliness.

Q.—Would pasture have anything to do with it?

Mr. BISSELL.—Grasses and stagnant water would.

Q.—Is cheese in the eastern section made on the Cheddar system.

Mr. BISSELL.—Almost entirely.

Q.—Could pin holes be worked out after salting?

Mr. Bissell.—Yes, but it is difficult. There is no difficulty before salting.

Q.—How do you find out when they are coming?

Mr. Bissell.—Take a knife and cut through the curd. You will find them appearing very small. This is the time to grind

Mr. James Whitton, instructor of the western part of the Eastern Division, between Toronto and Kingston, reported as follows:

MR. JAMES WHITTON'S REPORT.

To the President and Directors of the Dairymen's Association of Eastern Ontario:

Gentlemen,—With pleasure I submit to you my second annual report as cheese instructor, commencing my labour at the Mountain View cheese factory, Prince Edward County, and concluding at the Woodland factory, Northumberland County. The names of factories, and the time and order in which they were visited, is shown by the following list:

Prince Edward.—May 20th, Mountain View; 21st, Murney; 22nd, Ploomfield; 23rd, Union Vale; 24th, Elm Brook; June 9th, Ploomfield; 10th, Cherry Valley; 11th, Royal St.; 12th, Benson's; 13th, Maple Leaf; 13th, Grape Vale; 14th, Northport.

Durham.—May 19th, Crowne and Hope; 21st, Pickering; 22nd, Manchester; 23rd, Perrytown.

Northumberland.—May 26th, West Seymour; 27th Woodlands; 14th, Rylstone and Crow Bay; 15th, Minie, Brae, Royal, and West Seymour; 16th, Woodland; July 16th, Pine Grove, Warkworth and Codrington; 17th, Cramahe, Strong's, Brighton and Murray Union; 18th, Robt. Whitton's and Colborne's; 19th, Haldimand and Eddystone; 24th, Baltimore; 25th, Roseneath; 26th, Shaughnessy; Aug. 14th, Woodland.

Peterborough.—May 28th, Belmont; 29th, Cedar Grove; 30th, Trent Bridge; 31st, Crow Bay; June 17th, Trewern; 18th, Selwyn; 19th, Cherry Grove; 20th, Norman Hurst.

Lennox.—June 3rd, Napanee; 4th, Willit, Union and Odessa; 5th, Sillsville and Platt's; 6th, Amherst Island; July 2nd, Selby, Newburgh, Clark's Mills and Odessa; 3rd, Collins' Bay.

Hastings.—June 23rd, Enterprise, Sweet Bryor and Stirling; 24th, Eclipse; 25th, Highland and Front Sidney; 26th, Frankford; 27th, Sidney Town Hall; 28th, Sidney Town Hall; 30th Holloway and East Hastings; July 1st, Bronk, Melrose and Gould's; 10th, Milltown; 11th, Mountain and Thurlow; 12th, Stirling; 14th, Evergreen, Spring Brook and Maple Leaf; 28th, Cold Brook; 29th, West Huntington; 30th, Moira; 31st, Thomasburgh; Aug. 1st, Ashley's; 4th, Marmora; 5th, Ira Cook's; 6th, Marlbed; 7th, White Lake; 8th, Holloway; 13th, Plumb Grove; 14th, Woodland.

Frontenac.—July 3rd, Grape Vale, Glenburnie and Edginburgh; 4th, Hogan's, Pious Hallow, Sunberry and Live and Let Live; 5th, Duff's and Spafferton; 6th, Grape Vale; 7th, Metzler; 8th, Morvin; 9th, Napanee.

I manufactured in fifty factories, and visited and gave instructions in fifty-six—106 in all. Following is a statement as to quality: thirteen, fine; fifty-two, fair; six, only middling, and the remaining thirty-five very poor. Rennet—fifty-six in good condition, three using Hanson's Extract, four rennitine, forty-three with rennet unfit for use. As I have stated above, the fact that thirteen factories were making strictly fine cheese; fifty-two, quality fair; six, middling, and thirty-five very poor, is proof positive there is great room for improvement in the manufacture of cheese. The time has come when proprietors of factories must invest more money in their buildings and machinery, as the poor forlorn cheese-makers are not all to blame for not having their cheese of fine quality. All practical cheese-makers agree that you may have milk pure and everything in con-

nection with the same of fine quality to make a fancy cheese, and have it spoiled in the curing room; for some (and not a few) of our buildings are scarcely fit for pig styes. Patrons of factories appear to think they are economical by getting manufacturing done cheaply. The consequence is proprietors have, in most cases, to engage managers at such low figures and with little experience; everything is done cheaply, and as a matter of fact cheap cheese is the result. My opinion is that thousands of dollars are lost to the country annually from this cause alone.

We have had a great deal of trouble in our section with cheese-dealers culling cheese after contracting, which I think is a move in the right direction. If they will carry out the same plan from the commencement of the next season our cheese will be bought strictly on its merits. Manufacturers will have to put more brain-work into the business, and if they cannot make the desired quality they will have to get out of the way and make room for those who can. I was called upon to go to factories where they could not get within two or three cents per pound of the price contracted for, and after spending one or two days with them the cheese were taken at full prices. In one factory the difference amounted to from $40 to $50 per day.

I would say in conclusion that I had much pleasure in meeting Mr. H. Bissell in Kingston during the season, and making cheese with him at the Collins Bay factory. The maker that had been running this factory was discharged on account of making inferior cheese, and the proprietors would have us believe that the milk was such as to baffle all skill. Each of us took a vat, and we found no trouble in making a fine cheese, to the astonishment of all concerned.

In order that my report may be better understood, I wish to state that my duties as instructor were confined only to those factories which I had not visited the previous year.

All of which is respectfully submitted.

JAMES WHITTON.

Mr. BIRD.—Why has not Mr. Whitton visited my factories?

Mr. WHITTON.—I understood they were running all right. I attend to the worst ones first. Where no complaints are made I pass on.

Mr. BIRD.—We wanted your assistance and we did not get it. We want some satisfactory answer.

Mr. WHITTON.—Very likely. There are fifty or seventy-five factories in just the same position as you are. I don't visit all factories, supposing them, as I do yours, to be first-class.

The PRESIDENT.—Mr. Bird is to blame for not notifying Mr. Whitton, and Mr. Whitton is to blame for not calling, anyway. He must visit Mr. Bird in the future.

Mr. BISSELL.—Some of our best factories have been visited; they have invited us to come, and paid us $2. We sometimes go two years running. Mr. McCrae paid me $15.

Mr. ASHLEY.—This Association appropriates a certain amount of funds for paying instructors. It is not enough. We will have to adopt some measure of having to pay a certain sum, which is $2. If every one visited would pay that, the instructor could continue longer and visit more factories. We have failed to get all the factories to do that. Messrs. Whitton and Bissell visited my factories, and they got paid outside the Association. Factorymen not willing to give the price for instruction should not be visited. If more money were paid them they could visit nearly every factory. A great many have not paid at all, even after having received their services.

Mr. BIRD.—I have paid all that I have been asked for. I have found that they had time to go and visit other factories. Would it not be better to visit all factories in order.

Mr. WHITTON.—We have only seventy days for visiting.

Mr. ALEXANDER.—As to the question of pin-hole curd?

Mr. WHITTON.—I fully corroborate Mr. Bissell's method of grinding early and maturing without salting.

Mr. ASHLEY.—It is only fair to state that Mr. Bird was among the first to contribute

with his means to assist in inaugurating an Association, and to materially aid and abet its furtherance. The doors to these conventions have been thrown open to you a l. "free." You should come up to the people in Western Ontario in products. I learned there that they had received one cent per pound more for cheese than we have in Eastern Ontario. Is it because they are making better cheese? November cheese was sold there at 12 cents. There is something wrong either in the buyers or in the manufacturers.

The PRESIDENT.—It is in the manufacturers. (Laughter.)

Mr. BISSELL.—I think we are producing just as good cheese here as in the west.

A MEMBER.—Who took the gold medal at Ottawa?

SEVERAL VOICES.—Mr. Agar.

Mr. McPHERSON.—Before we can establish a high standard we must make a large quantity. The great bulk enables others to obtain a standard over us. Inspectors are going around to raise the standard of products. It is only in this way that we can receive benefits and increase values. There is no possibility of getting a high price for any quantity when the bulk is inferior. Raise the quality so as to create a reputation, and thereby increase the means sufficient to raise a high price.

Mr. McCRAE.—According to the Western official report, we stood ahead.

The PRESIDENT.—Every time eastern men come into competition with the western we have carried the day. There are only just a few here who have reached a high standard. I would like to encourage everybody to take an interest in this business. Start a factory with 600 cows, with suitable buildings, a good, warm work-room, and everything else appertaining to neatness, comfort and convenience. We have got to put money and brains into the business. How can we expect with so many little factories badly ventilated, with no control of the atmosphere at any season of the year, little old fashioned, ill kept stables, unskilled operators, etc., to compete with the men of the west, where every attention is paid to the proper erection of buildings and the careful handling of their products; where 300 cheese are made in three days, and where fifteen to twenty per cent. of the cheese is well made?

Mr. McPHERSON.—How shall we overcome the difficulty? The best means to bring up the standard would be to have an inspector in each county to report not only the quality of the cheese, but also the quality and condition of the milk, and see that there is no skimmed or watered milk used. The people should encourage and assist each other by united efforts. It is the large quantity of high quality that we want. An inspector by repeated visits would be enabled to note the marks of improvement, and by well-timed suggestions bring about the consummation devoutly to be wished for. He should be employed the whole season through.

Q.—Which is the best way to make white cheese?

Mr. WHITTON.—The best method is to keep the curd covered through the whole process. Warm after taking from the press, and then put in a perfectly dark room.

Mr. McCRAE.—In white cheese you lose a great deal of cream?

Mr. WHITTON.—Not at all.

Q.—Would you make cheese white, and leave pin-holes in, or colour, and get rid of pin-holes?

Mr. WHITTON.—You can get rid of the pin-holes by leaving off the cover.

Q.—What harm do the pin-holes do?

Mr. WHITTON—Skippers get through easier.

The PRESIDENT.—It harms the cheese three cents a pound.

A MEMBER.—We cannot make a strictly white cheese from bad milk. A "gassy" curd could not get rid of pin-hole pores without giving it colour from having to stand too long a period with the cover up.

The convention then adjourned till 7.30 p.m.

WEDNESDAY—EVENING SESSION.

The evening session resumed at 7.30 p.m., the President in the chair.

The first speaker introduced was Mr. Wade, of Toronto, Director of No. 6 Division, who read a paper on "Cows for the Dairy."

[This paper is printed in the proceedings of the Western Convention, page 5.]

After some discussion on the subject of Mr. Wade's paper, the President introduced Prof. J. B. Harris, of Antwerp, N.Y., who read a paper on the subject of "Hints on Cheese-making."

[This paper will also be found in the Western Association's Report, page 61.]

Mr. S. Payne.—What would cause the rind of cheese to mottle, and yet be of one colour inside?

Prof. Arnold.—The cause of that discolouration on the surface of the cheese is because of its lying a little too long where the moisture draws out of the cheese and sours between the table and the cheese. Colouring is prepared with alkali, and when present with strong acid it changes colour. The acid produces one colour and the alkali another. By lying too long the moisture oozes out and makes discolouration without affecting the cheese inside. Turning would affect it.

Mr. Alexander.—When cheese is mottled on the rind, it indicates young cheese, not matured cheese.

Mr. McPherson.—I think it originates from the class and kind of wood used in the boards. Pine invariably produces that colour. Hemlock, soft maple and other woods have not the same effect.

Prof. Arnold.—I have never observed that difference.

Mr. Alexander.—A case occurred in Brockville in which a batch of white cheese after being matured became quite mottled on the inside, and no cause could be assigned.

Prof. Arnold.—The change of colour in white cheese is due wholly to the action of light on the curd. Some portions will change their colour by being more or less exposed much sooner than others. The lumps on the top will be discoloured, and that which received no light will be white.

Mr. Alexander.—In this instance to which I have referred the cheese was mottled to that degree that the discolouration appeared to be due to annato. When we took out the plug we saw pieces laid in as if they had been coloured. My explanation was, that the curd having the high colour had been made on the former day, mixed in with new curd next day and pressed. The one being so much more open to exposure to the air, naturally became of a deeper colour, and, for the reason that it would not readily assimilate with the other, it took on the appearance I have described.

Mr. Bissell.—Rusty curd has been found in several factories; that would also indicate the presence of annato.

The President.—There is more rustiness in the maker, perhaps!

Mr. McPherson.—We had some of this cheese which had a distinct colour in the vat, and there was no accounting for it. It created a rustiness of a very peculiar hue, and gave a mottled reddish colour to the cheese.

Mr. Harris.—There will be as many as fifty factories all having curd spread out, and remaining till next day, when it was already fit to put to press. Of course it must have got all soured over. Mixing this with the new curd causes mottled cheese.

Mr. Thompson.—I have noticed this vivid colour on the whey, and the curd would have a slimy condition. We had to wash some of the curd in order to get the moisture properly out. I found that tapping it earlier in the day had a beneficial effect.

Prof. Arnold.—Some of these cases are different from any I have seen. I have

seen a mottled appearance, but nothing of the character described. Very frequently, however, colouring is used pretty strong—without reducing it. Then it will form a spot that will not come out, but remain in coloured specks.

Mr. McFarlane.—In one section of country two factories, one mile and a half apart, are subject to this discolouration, towards the latter end of the season. This colour in the curd may be noticed after tapping, and in raking it up may be scraped off the sides.

The President.—Where do the cattle feed?

Mr. McFarlane.—On limestone meadows.

Mr. Bissell.—Perhaps cows drinking iron dust would cause it.

Prof. Arnold.—I don't think cows could get enough of it. Bloody milk would do it.

Mr. Alexander.—A salesman who took a great interest in finding out the cause said that in soaking the rennet in water it became impregnated with iron. The water drank by the cows being very strong with the mineral might lead us to a conclusion.

Prof. Arnold.—Iron would discolour some. The chemical nature is such that the water and mineral will combine, and oxide of iron will enter these cheese right through the salt.

A Member.—Discolouration shows more plainly according to the age of the cheese.

Prof. Arnold.—I remember one case wherein the difficulty lay in the salt. The discolouration did not show immediately, but after a few days the cheese were discoloured and the specks enlarged, and new ones broke out somewhere else. By the time the cheese were thirty days old you could do nothing with them.

Mr. R. K. Milroy.—What is the cause of the milk varying in quality between the night's and morning's milk?

Prof. Arnold.—In the summer the morning's milk is richer than the night's milk, because the time is shorter between the milkings.

Mr. Milroy.—Would fretting the cows by dogging, and the action consequent upon getting their food, cause the night's milk to be poorer?

Mr. McPherson.—We always make a difference between the morning's and night's milk in perfect milk. The cow being quieter, having less exercise, would have a tendency to increase the cream. We have always to make allowance for morning's milk.

Prof. Wetherell.—How does Prof. Arnold settle the test for good milk? Is it by cream solids or fats?

Prof. Arnold.—That may be answered in a good many ways. How much fat you cannot tell by the cream. You can compare by the same cow at different times, but you cannot tell the value of cream from two different cows; you cannot compare them by the quantity of cream each cow's milk produces. They may both show the same quantity of cream, and yet not make the same quantity of butter or yield the same quantity of fat on analysis. It depends on what you want to find out. If how much butter, you must churn, and do very accurate work in the churning. If for cream you must analyze it or make an exact test of the cream in it. As a general rule, there is a close approximation between the quantity and value, but that cannot be relied on.

Prof. Wetherell.—The law of our State has a fixed rule. To be whole milk it must have 13 per cent. solids; it does not specify as to the fats. Inspectors have found upon examination of different dairies that only one out of ten failed to come up to this standard. They were prosecuted and fined according to the law. I believe the record we have over in New York State is 12½ per cent.; in Boston, 13 per cent.

Prof. Arnold.—Cream is no test. In one case I know of, out of sixteen examples all sorts of results were got. The Fairlamb system is not a just one to the dairymen. The cream is different in each cow's milk. The greatest variation in results arises from a difference of temperature. In a lower temperature it comes up rapidly, at a higher it comes up slower, that is, when not cooled so fast. It makes less bulk but more butter.

Officers and Members.

The President.—The election of officers will take place to-morrow morning. You have an interest in the parties representing you. In order to be able to vote you must pay $1 and receive the book printed with the minutes of this meeting. You are each entitled to the services of the instructor. There is nobody who is not interested in this business.

Brenton's Patent Cheese Box.

Mr. H. Ashley, in exhibiting Mr. Brenton's cheese box, said that it had been conceived by that gentleman as being capable of serving a two-fold purpose, viz., that of box and bandage combined. The material of which it was composed was paper or leather board. Cheese had been made in those boxes and shipped, and they have been found to cure much better and stand the hot weather much better. Instead of the rind being thick, it did not exceed that of a case-knife blade. It was clear gain to the consumer, because he could eat all the cheese, there being scarcely any rind. In pressing one in a bandage cloth, and another in the box, it cured with a difference of from one to two pounds more. After the cheese was pressed all that it was necessary to do was to put on the covers and ship. They could be kicked all around the room. (A voice—kick it.) Suiting the action to the word the speaker kicked one several times across the platform, stating that sixty pounds had been pulled down from a high shelf and fallen to the floor without doing injury to the cheese. Continuing, he said they would cost fully as much as other boxes, but there would be a saving of one and a half pounds of cheese on a cheese weighing from fifty to sixty pounds.

Q.—How thick is the paper?

Mr. Ashley.—One-sixteenth of an inch. They can be shipped easily, and they take up very little room.

Mr. Alexander.—Would they leak and soften the paper?

Mr. Ashley.—No; the paper hardens. It is soft at first, but grows harder.

Q.—Where are they made?

Mr. Ashley.—In Belleville.

Mr. Ashley said that he would like to hear Prof. Arnold on this subject.

Prof. Arnold.—I have no experience to speak from, but can say as to the fact of their saving a considerable portion in the quantity of cheese. Cheese when ground and cured in the open air shrink more than when cured in the box. Those cured in the cellar have been better than those cured on the shelf in the open air. There is another fact in regard to them. The flavour will not be as high as if they were cured where it was more moist and open to the air. The air is excluded to some degree, and as flavour depends on access of air the cheese will be milder and richer, with more moisture in them. It is certainly an advantage to the cheese to have the moisture retained, and be of sufficient consistency to endure transportation.

The Convention adjourned till 10 a.m. Thursday.

SECOND DAY'S PROCEEDINGS.

The Convention resumed at 10 o'clock on Thursday morning, the President in the chair.

The business opened with the reading of the Auditors' Report by Mr. P. R. Daly, Treasurer, which was as follows:—

Receipts and expenditure of the Eastern Dairymen's Association for the year ending February 3rd, 1885.

RECEIPTS.

1884.	
Feb. 20.—To balance from last audit	$ 285 57
" amount of members' fees	159 00
" Government grant	1,500 00
	$1,944 57

EXPENDITURE.

1884.	
Feb. 21.—Paid professors at Convention at Peterboro'	$175 00
" reporter " "	40 00
" auditors' auditing accounts of 1883	23 40
" cheese instructors	23 00
" other expenses at Peterboro' Convention	192 50
" printing	142 65
" delegates to Ottawa	35 00
" cheese instructors	700 00
" dairy prizes at Provincial Exhibition	200 00
" Board meeting at Ottawa	127 00
" interest on loan	4 57
" Secretary's salary	110 00
" allowance for postage, stationery, etc	30 00
" Treasurer's salary	25 00
Balance on hand	114 95
	$1,944 57

We, the undersigned, beg to report that we have examined the books and accounts of P. R. Daly, Treasurer of the Eastern Dairymen's Association, for the year ending February 3rd, 1885, and find that the receipts have been $1,944.57, and the disbursements 1,829.62, leaving a balance in hands of Treasurer of $144.95.

All of which is humbly submitted,

P. H. McCREA, } Auditors.
J. S. HAMILTON, }

MORRISBURG, February 3rd, 1885.

Moved by Mr. Daly, seconded by Mr. M. K. Everetts, That the Treasurer's financial report as audited be received and adopted.—Carried.

ELECTION OF OFFICERS.

Mr. DERBYSHIRE said that he had to thank the Association for holding the position of President by acclamation. The directors had been doing everything they could to further their interest, and he hoped they meant to carry on the work as successfully as heretofore. He then called upon the Nominating Committee to report, Mr. Ashley taking the chair *pro tem.*

Mr. PLATT HINMAN read the report as follows :

We, your Nominating Committee, beg leave to report, nominating and recommending the following gentlemen as officers and directors for 1885, viz. :—

President	D. Derbyshire	Brockville.
1st Vice-President	D. Vanderwater	Foxborough.
2nd Vice-President	Thos. Walker	Wellman's Corners.

BOARD OF DIRECTORS.

Division No. 1.—	D. M. McPherson	Lancaster
" 2.—	Ira. Morgan	Metcalfe.
" 3.—	James Bissell	Algonquin.
" 4.—	James Haggerty	West Huntington.
" 5.—	P. Hinman	Grafton.
" 6.—	H. Wade	Toronto.

AUDITORS.

James Hamilton	Belleville.
F. McRae	Spring Valley.

All of which is respectfully submitted,

PLATT HINMAN,
D. VANDERWATER,
JAS. BISSELL,
} Committee.

MORRISBURG, Feb. 5th, 1885.

Mr. HINMAN moved the adoption of the report.

Moved by J. Alexander, in amendment, seconded by Alex. Farlinger, That the following named gentlemen constitute the Board of Directors for the Eastern Dairymen's Association of Ontario for the year 1885 :—

President	D. M. McPherson.
1st Vice-President	D. Vanderwater.
2nd Vice-President	Thos. Walker.

DIRECTORS.

District No. 1	D. B. McLennan.
" 2	Ira. Morgan.
" 3	James Bissell.
" 4	James Haggerty.
" 5	Platt Hinman.
" 6	Henry Wade.

Mr. ALEXANDER.—You are all very well aware that Mr. McPherson has been a representative of this Board for a long time. He has never asked for the position of President, and when spoken to by his friends about it, he said he would not ask for it, but if friends saw fit to give it to him he would act. He has shown great modesty in that. Certainly, his reputation as a dairyman and a business man does much to enhance him in the value of the Association, and when we take into consideration the length of time which he has spent as a director on this Board, we must understand that he is a gentleman particularly fitted for the office which is now being contested for. The single fact alone of his being the largest cheese manufacturer in the world ought to place him as an acquisition and an honour at the head of this Association. He is one of yourselves, engaged in the same pursuits ; this thought is one not to be lightly passed over, and when you come to vote I hope you will consider these matters. Mr. Derbyshire fills the position very creditably, but he, like myself, is not a dairyman really ; we are "cheese-buyers." With respect to Mr. McLennan, although a stranger comparatively, he is a man possessing so many qualifications, owing to his wide range of information and his having served on the Council Board, and above all his being a practical dairyman, would, all things combined, render him a man most worthy to fill the vacancy which would be created in Division No. 1 by the promotion of Mr. McPherson to the position of President.

The votes were then polled by ballot, and after the count up it was shown that Mr. Derbyshire had been returned by a good majority.

Prof. Arnold's Rennet.

In answer to a question, Prof. Arnold said that his rennet extract would be on sale by F. W. Brenton, at Belleville, for the district between Toronto and Kingston, and would be on sale by an agent at some point east of Kingston in barrels, and ten to fifteen gallon packages. An agency had not yet been located east of Kingston, but would be probably at Brockville. Notice would be given to factorymen hereafter.

Q.—How much rennet should be used for the purpose of coagulation?

Prof. Arnold.—One pint of my extract to 5,000 lbs. of milk at 84° Fahr. coagulates in fifteen minutes.

Mr. Ashley just here took occasion to introduce the re-elected President, Mr. Derbyshire, who came forward amidst cheers, and in response said that he thanked them very kindly; that he knew of course that he would be elected, notwithstanding the supreme efforts made to defeat him: that he had been elected by a splendid majority and was naturally feeling very much pleased about it. He felt satisfied that Mr. McPherson had had no part in bringing on the election, and that if it had been his to give away he would have given the position to him.

The President then called on Prof. Arnold, who read a paper on "Dairy Products as Food."

[This paper appears in the report of the Western Association's Convention, p. 49.]

The Convention then adjourned at 12.30 to meet again at 2 p.m.

THURSDAY AFTERNOON SESSION.

The Convention met at 2 p.m., the President in the chair.

As the adjournment took place during the reading of Prof. Arnold's paper, he resumed, and, after he had finished, Prof. Wetherell, of Boston, followed with an *extempore* address on "Dairy Husbandry" as a specialty.

Dairy Husbandry.

Prof. Wetherell said there was no vocation in which farmers were engaged so interesting as that of selling milk to be peddled in our cities and villages. On the other side the remark was often heard that the foundation principle of successful farming is the dairy business. I think that in Canada, in that portion with which I am familiar, the same is true. No doubt the farmers here are convinced that the best business for them to engage in is dairy husbandry. In the first place, the first question to decide is whether your farm be adapted to dairy husbandry or not? If not, don't go into it. In regard to this point it is no truer of dairy husbandry than anything else. Dairy husbandry in the United States is becoming, if not already so, a "specialty." I believe in specialties in farming. It is said in an old maxim that "you must not put all your eggs into one basket." But it strikes me that if you go into mixed farming you won't have much to buy eggs with. The farmer must have some one crop on his farm that he can depend on for his money, because he has some bills to pay every year. If he has a little of everything it is hard to get the money together. Your taxes you have to pay; you want money to provide your wife with a new silk dress and a new hat; the necessary wants of the good woman must be supplied. This would indicate the necessity for some specialty. After you get your farm all ready for dairy business, the next step is to find out what kind of cows to put on that farm. It is just as important to find out what kind of cows are best for you as it is to find out who the best buyers of the products are in your community.

The buyers will not always tell you that your cheese is good. They do their business for dealers, and they have to say that the cheese is "off flavour," and the butter is not "gilt-edge." (Laughter.) In the words of Solomon, "When he is gone he boasteth." With regard to this you can readily see how sometimes selfishness becomes permeated in the mind of the buyer as well as the seller, and when the two come together there is an odd clashing of interests. You should be good business men, understanding all about these affairs.

The idea puzzles me, when I find farmers so close and so saving that they don't have any paper to depend on for the markets that is less than a month old. When they come to enquire about the price, and the buyer knows that they don't take any paper he will show them a weekly. Never do without a paper you can depend upon; get the best information you can. One of our buyers said that after being out two or three weeks, and he came across the Boston *Cultivator*, newspaper, and saw the reports he would buy as soon as if he were in Boston. No department of journalism is so puzzling or so difficult to an honest man to get at as the prices. The consumer goes to the buyer with his paper and shows him the prices. The buyer says, "Do you think we are going to sell butter at any such price as that?" Then that man goes away, thinking that the paper has cheated him. Some papers report the receiver's price, who pays so much for it, and the man who looks at the paper supposes he is going to buy at that price. The jobbers' price is another thing. The whole difficulty lies in this one direction. The cost of distribution between the producer and consumer is immense. These middlemen make the money. Buyers pay starvation prices, and the consumer extortionate prices. The farmers put on the market the means for their prosperity.

Farmers, you have some reason to act on this point as well as the consumer. If you had a little more system among you: if you had clubs and associations whereby you might be enabled to sell at market prices, things would go differently with you, and to your advantage. In Boston, two or three years ago, a great change in the price of cheese took place. It hadn't got into the weekly papers to help the farmers; and the buyers knowing that they didn't take any other papers, went to each factory where they had been prospecting on the cheese before and could not make a bargain, and bought them out dry. Next morning the news came that a great advance had been made on the price of cheese. They were mad enough, but couldn't help themselves after the bargain was made. If they had taken the newspapers they would not have thus suffered.

What is the best breed of cattle? You might as well ask any other question, as pointless as that. My reply is, What do you want to do with the cow? If you want to make butter, and know how, take the Jersey and Guernsey together. Their milk taken together produces better butter. If you are making milk to sell by the can, use Ayrshires. There are no cattle so well-bred as the Shorthorns. To quote Mr. Bates, as quoted by Allen in his history of Shorthorns, he says:

"I select this tribe (Duchess) of Shorthorns as superior to all other cattle, not only as small consumers but as great growers and quick grazers for the finest quality of beef. My first Duchess calved at Holton Castle, June 7th, 1807. She was kept on grass only, in a pasture with nineteen other cows, and made in butter and milk for some months above two guineas per week."

At a meeting a short time ago, it was said by a farmer, the Shorthorns came from the Holsteins. Indeed! I said: the Shorthorns were known in Great Britain in the time of William the Conqueror, A.D. 1066. This was rather a stunner. In the general outline they resemble those animals still. In the past history there was a time when the Holsteins, some of those black and white cattle—were brought into England and crossed with Shorthorns. These two crossed have been quoted as a stigma to the Shorthorns having that blood. Adam Bates maintained that Shorthorns were a race. The question was squarely put to Mr. Sheldon, who is writing up the dairies of England and the United States—"Which is the best breed of cows?" He said: Shorthorns—a large animal, whether of the Holstein, Shorthorn, or Ayrshire breed, will make more milk out of a given amount of feed than a small cow out of a given amount of feed; therefore get a hearty eater of good size; you will get more beef at the end. In this connection I may say that one of the evils you are subject to is in testing the possibilities of the cows, but that is not what you

want to know. You may make 867 lbs. of butter from a cow, besides the cheese. Out west a man has made in one year 965½ lbs. of butter from one cow. This is high.

As to milk, when you have your kind of cows, find out how many you have in your herd which do not pay for their keeping. You must test your cows by record of milk. Place a bill where the milk of morning and evening may be written down. There are cows in New England that don't give 3,000 quart cans full in the year. No man should keep a cow long that does not give 8½ quarts per day.

Q.—What would be the cost of keeping a cow which gave one thousand lbs. yearly?

Prof. WETHERELL.—With a herd of fifty head it costs ten cents per day, fed on steamed food, composed of barley, hay, and corn-cobs—where the corn has been husked—and also corn and cobs ground together, with rye and barley.

Mr. SHAW.—What proportion?

Prof. WETHERELL.—About half corn and cobs, and one quart each of barley and rye

Q.—Do you think that a good feed?

Prof. WETHERELL.—I don't know; there is diversity of opinion.

Mr. BISSELL.—Should a heifer come in at the age of two or three years?

Prof. WETHERELL.—At the age of two and a half years is the limit for usefulness.

Q.—Is there any difference in feeding; has it a destroying effect on those highly fed ones?

Prof. WETHERELL.—There is no doubt.

Mr. MCPHERSON.—I think every farmer should know the possibilities of his herd of cows, not only in the amount of production but in the profitable possibilities of the cow. I suppose there is a limit to the extent of profit in dairying, that is, a limit of a high standard: 900 lbs. of butter have been received from a cow in one year. It would be satisfactory to know the cost of feed for that amount of butter. We could easily substract returns from expense and get an idea of the profit. This would improve the stock of our country and settle the question of profitableness.

Prof. WETHERELL.—There is no objection to testing the possibilities of a cow, but to suppose that a cow can be kept up to that point is an impossibility. Mercedes, which took that prize, was buried in the cemetery of the stock yard.

The chairman then introduced Mr. Thomas McDonald, of Morrisburg, who read a paper on "Butter-making."

BUTTER-MAKING.

In attempting to offer a few observations on butter, I find myself confronted with an array of conflicting opinions relative to the best mode of producing the most butter from the least quantity of milk. As this phase of the question has been from time to time discussed by the dairymen of the Province, I shall not here refer to it, but simply allude to butter-making in its ordinary sense, its use as an article of food, its advantages as an article of commerce, and inquire into the causes that have almost led to the seclusion of our butter from the English markets. In speaking of the seclusion of our butter from the British markets, perhaps the most direct way to put it is to give you quotations from some of the markets to show they have entirely ignored our butter in their quotations solely on account of its inferiority, and have given the place to butterine. Herewith find quotations:—

BUTTER.

Finest consigned Friesland, "perfection"	130/
Finest Friesland, "Trade Marks"	126/
Fine Friesland, pure flavour	112/
Good Friesland, "a bargain"	74/ 80/ 84/
Finest Creameries, "perfection"	112/
Very fine Creameries	84/ 94/

Finest Normandy, 28 lb. baskets	136/
Finest Normandy, firkins	136/
Fine Normandy, 28 or 56 lb. baskets or firkins	120/
Finest Brittany, 28 lb. baskets, or 56 lb. firkins, "perfection"	122/
Finest Brittany fresh, 2 dozen boxes, 2 lb. rolls	18/
Extra choicest Brittany fresh, do.	19/
Finest Italian, 28 lb. baskets	134/
Finest fresh 2 dozen boxes, 2 lb. rolls	14/9

BUTTERINE.

Finest half-and-half 28 lb. or 56 lb. baskets, "Gold Medal"	130/
Finest 28 lb. baskets, "Silver Medal"	76/
Finest 28 lb. pails "OIHO"	80/
Finest 14 lb. or 28 lb. tubs, "perfection"	72/
Very choice do do	66/
Fine fresh do do	60/
Fine fresh, 14 or 28 lb. tubs or boxes	56/
Half-and-half, finest Dutch, 48 lb. firkins	46/
Buttercups, 1 lb. rolls, 1 dozen boxes	7/6
Good sweet fresh, 28 lb. tubs	46/

The following extract from a letter from Wm. Heapy & Sons, Liverpool, respecting the state of the market, will also go to show the undesirable grades of butter now in that market, a large part of which is from Canada—"This market is rapidly getting demoralized for anything and everything but the very finest selections, and these are looked at and examined critically enough to make the buyer fastidious and the butter faultless to pass. When these conditions are filled fairly good prices can be made, but if not, no sale."

I might also give you extracts from other Liverpool and London houses, speaking in the same strain as to quality, "unless your butter attains a certain standard of quality, sale will be slow and prices low and unsatisfactory." Let us now look at the American view of the question and take an extract from a letter written by George W. Kennedy, Waterbury, Vt., and published in the Boston *Journal*, Dec. 16th, 1884:—"At nearly every stall you see the contents of a butter tub turned bottom up on a table, the dark, unclean surface of which gives some whiteness to the colour of the butter by contrast. Some specimens are almost as white as lard, with here and there a tinge of yellow. But the natural colour is largely modified by the 'dust of the earth,' 'specks,' 'motes' and whatever other foreign element might be absorbed by the cream where the milk is set in the one room that is used for a dining room, sitting-room, and sleeping-room for the whole family, including dogs and cats. Manifestly the butter had not been 'overworked,' nor packed solidly into one conglomerate homogeneous mass. Prominent seams marked the lines of division between each 'churning' as distinctly as the strata of the old sand rock formation. And the 'specks' gather more quickly along these seams. Sometimes the 'formations' are pried apart and handled separately like cakes of tallow. It has been said that every one must eat a peck of dirt before death. Now how long will it take the good people of Montreal, supplying their tables at this market, each to accomplish his peck. It is quite evident that the *habitans* have not yet learned all there is to the art of making butter."

I am not prepared to endorse this criticism as being substantially correct in every particular, but I believe there is a great deal of truth and argument in the fact, and the sooner our people are made aware of the opinions and criticisms of others the better for them and their dairying interests.

The dairyman of Ontario, nor even of Canada, has no justifiable apology to offer to shield the imperfections of his dairy. Nature has provided him with a rich and fertile soil, abundance of pure spring water, easy of access, and facilities for the manufacture of butter, both on the creamery and dairy system, unsurpassed by any other country on the

continent. All that is required to make Canada the foremost dairying country in the world is unity and concerted action on the part of the dairymen. Let the dairymen of this country once awake to a realization of this fact and their first step will be to familiarize themselves with the actual requirements of the market in which they desire to place their surplus make.

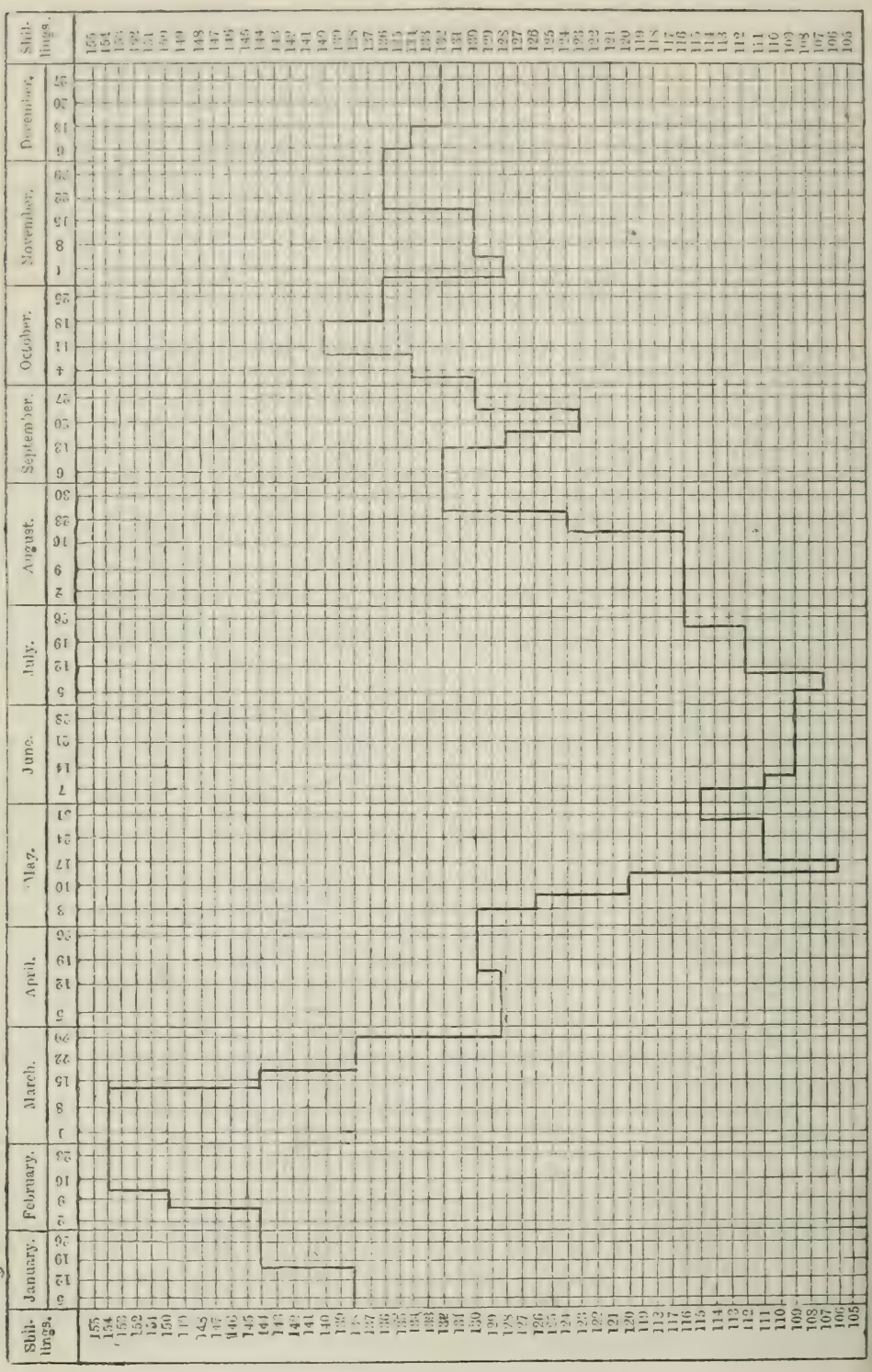
This should be the all-essential information to the butter producer, and the dairyman who neglects this initiatory step incurs the risk of manufacturing a quality of goods unsuited to the market for which it is intended, and thereby sustains personal loss himself, inflicts a loss indirectly upon his more progressive and diligent neighbour by deteriorating the standard of the butter as a whole, and lastly, brings into bad repute as a butter-producing country the nation of which he proudly boasts. Every man owes a duty to himself, to his neighbour and his country in this respect, the interests of the one being comparatively identical with the interest of the whole.

The butter-maker, a producer, is no exception to this general rule, and unless he aims at the honourable discharge of those several duties in the manufacture of his butter as an article of human food, he falls far short, in my estimation, of the true standard of a dairyman actuated by worthy and honourable motives. At this point I may here refer to the prevalence of a system among our dairymen of holding their butter that was once fresh, sweet, and nutritious, until it becomes unfit for human food, simply because they cannot get twenty or eighteen cents or some other nominal price, or because neighbour Jones sold his butter at twenty cents and I must have the same. Now this selfish principle must be utterly routed from the minds of our dairymen; and to make dairying a success in this country we must follow the example of other important dairymen in the old country if we intend to place our surplus butter there for sale. Here is the result of the prices obtained by Normandy for their butter during the year 1884, showing the fluctuations of the market, and I think should fully convince the most incredulous that their butter is regularly sold irrespective of market values. Herewith find review for 1884 and table of fluctuations:

"The opening of the year found rates much upon the same basis as in 1883, and, as usual, they took an upward tendency until the middle of March, price then being some 4s. dearer than 1883. The downward course then set in, until "bottom" was reached in middle of May, some weeks earlier than usual. At this time our home make was in large supply, and kept prices low. From then until early in July prices ranged low. Seeing that the "pick" ranged from 106s. to 110s., one may judge of the excellent value that could be found at 96s. to 100s. July found an upward tendency, and the drought making itself felt in August, stronger rates began a good month earlier than usual, a jump of 16s. in two weeks being made during that month. This advance soon brought increased quantities, and the market steadied itself for a time, but again took a jump and forced itself to 140s. in October, owing to short supplies. These prices could not stand, and a dull and dragging trade ruled through November at lower rates: and although December found a better trade, prices ruled 8s. to 10s. lower at the close of the year when compared with last."

In glancing over the market quotations of Liverpool, London and Bristol, the following query forcibly suggests itself to my mind; "Can it be possible that this butter I see quoted from 140s. to 155s. per 112 lbs., equal to from 28 to 31 cents Canadian currency, is made from the same substance as that from which the ordinary Canadian dairyman makes a butter quoted in the same market from 65s. to 80s. per 112 lbs., equal to from 12 to 15 cents per lb. Canadian currency?" Here is an average difference of 16 cents per lb. between those two grades referred to, and while the former is eagerly sought for as an article of food at those relatively high prices, the latter is kicked about from place to place and only taken as an article of food when all other sources of supply have failed. The introduction of the creamery system in this country has to some extent improved the standard of our butter in the foreign markets, and if the system is further improved so as to conform to the tastes of the English buyers, a still higher standard may be reached, better prices may be obtained, and a reliable outlet secured for our higher grades of butter which, indeed, form but a small percentage of our entire production. But on

NORMANDY BUTTER



medium and lower grades of butter, principally the production of ordinary dairy makers, and creamery makers of no practical experience, shall continue a drug in the market as long as the present system of making and selling butter is obstinately persisted in. Dairymen alive to their own interests should awake from their present indifference, and particularly Eastern Ontario should set to work with a will, determined to regain that reputation which they have lost in the last three years. This can be done; it is not yet too late, even for the ordinary dairyman. To him I say, put your house in order, let scrupulous cleanliness be strictly observed in and around the dairy-room. Make no mistake in the salt you use nor in the quantity you put in the butter. Buy nothing but the best, and in no case put in more than ¾ oz. to every pound of butter. Spare no pains to make butter of a rich flavour. This particular quality is frequently lost by the dairymaid handling the butter while her hands are moist or even greasy. This should be carefdlly avoided, as butter is susceptible to the most minute adulteration. I know of no way so successfully to guard against this as washing the hands in oatmeal water before handling the butter. There is no reason why the dairyman of Canada cannot produce a quality of butter equal in every respect to the butter referred to already in this paper. It only requires *push* and *energy* and a determination on the part of every dairyman in the Province to have recourse to the best means of knowledge available for the making of the best butter.

We can, we will, and we must raise the standard of our butter, should be the response of every dairyman. We will conform to the best modes of making rich, sweet and nutritious butter: we will pack in nice clean tubs and sell our butter while it is fresh, sweet and palatable and fit for human food. Year after year heavy losses have been sustained by holding our butter till late in the season, until now we are convinced that our only hope for securing a market for our surplus butter is to compete on the foreign markets at all times in the year. Our facilities for shipping butter from Canada are such as to enable us to do so, and if the farmers will only lay aside this selfish principle of holding for higher prices and sell their butter at best possible price obtainable while it is pleasing to the eye and taste, the buyers will be only too glad to respond and make provision for placing their butter in every market in England. It will soon become known and appreciated, and instead of losing annually large sums of money, as has been the result with the majority of makers for many years, the butter-maker or producer will be financially benefited, his neighbour indirectly benefited, and the products of our dairies will hold a place in the estimation of the foreign consumer that has never been attained before. Then, I say, act unitedly in this matter, act as a people desiring the same end, and let us as a people bury now and forever the system of holding our produce entirely out of season, and let its burial be remembered by the people of Eastern Ontario particularly, and if needs be, for fear of a resurrection, let me dedicate the following epitaph :—

Reader! behold a monument
That asks no sigh or tear,
Though it perpetuate the event
Of a great burial here.

Mr. McPherson.—Butter buyers are holders and we recommend them to sell also.

The President.—Buyers have done everything they could to get this system adopted. It will bring millions of money into this part of country. When butter is quoted, Canada must be named in the list.

Dr. Chamberlain, of Morrisburg, was then called to the platform. He congratulated the Association on the success of the convention and said he was sure the farmers of Dundas county, as well as all others present, would be stimulated to greater efforts in dairying as the result. As an evidence of the growth of the dairying interest he pointed out that Mr. Arza Parish, of Farmersville, and himself had been the first to establish a cheese factory in this eastern part of Ontario about fifteen years ago and now factories are scattered all over the different counties.

The following paper on Dairy Husbandry was read by Prof. Leander Wetherell, of Boston :—

DAIRY HUSBANDRY.

There is a general complaint of the depression of agriculture and commerce. I invite attention to some notable facts in this connection. The underlying or bottom fact is the abnormally low price of wheat and maize; barley and oats are selling at normal prices. The low price of wheat is notable in England as in America. In England the average price of wheat on the market is 32s. per quarter, and 30s. on the farm. Wheat cannot be shipped to England from America without loss to the shipper. A Scotch farmer in Minnesota telegraphed to a friend in England that impending ruin is his lot if compelled to sell his wheat crop at prices now offered in Minneapolis, the great flouring mill centre of the North-West; and this, notwithstanding a favourable season and a most bountiful crop. The wheat crop in most of the countries of the wheat-growing belt of 1884 was much above the average, thus causing the supply to greatly exceed the demand, and, therefore, to depress prices and everywhere to render wheat-farming unremunerative.

An English estimate of wheat production (leaving out China) was, for 1884, 25,000,000 quarters of the nations which grow wheat to export. An excess of 6,000,000 of quarters pressed upon the markets of Great Britain, France and Belgium, beyond ordinary requirements, has served to depress prices on both continents. Cheap bread is favourable to workers and artisans; the four-pound loaf sells for 4d. The total value of the crop in England after deducting seed is but £15,000,000. The import of 1883 of wheat, flour, maize, and grain of all kinds, was valued at £67,622,367, of which £43,799,259 was the cost of wheat and flour. The farmers of the United Kingdom and Ireland sell annually £30,000,000 value of milk (two and a half pints per head per week), double the value of the wheat crop in 1884. If other countries in the wheat belt can raise wheat cheaper than it can be done in Great Britain, why do they persist in trying to grow it? There was imported last year the following commodities from foreign countries, valued as follows:—

Butter and butterine	£14,773,000
Cheese	4,890,000
Eggs	2,732,000
Poultry and game	591,000
Total	£22,986,000

England might grow less wheat and more commodities, and produce more beef, mutton, bacon, butter, cheese, milk and eggs. More stock should be raised and less store cattle and sheep purchased. The farmers who suffer least from the depression now complained of, and are fairly prosperous in these times, are men who, with wives, sons and daughters, work industriously with their hands, whether in Great Britain, Canada or the United States.

An English writer says there are commodities, of which there are many, that can be raised cheaper than wheat; and he adds, that he is persuaded that working, industrious farmers and their families can, by giving attention to the rearing of calves, pigs, chickens, dairy products, and thus change depression in farming to profitable husbandry. Besides the commodities named—which farmers can raise better than are imported and thus cause less importing of live bovines and sheep and dead meat so heavily as is now done—the following are some of the items of England's imports of 1883:—

Live animals, oxen and sheep	£11,850,000
Dead meat, salted and fresh	2,894,000
Meat unenumerated	808,000
Preserved meats (not salted)	1,753,000
Mutton	696,000
Bacon and hams	10,036,000
Total	£28,037,000

Much might be done to diminish the necessity of depending on foreign countries for the necessaries of every-day life. Many have learned that it is profitable to raise pigs for ham and bacon and thus diminish the annual paying out of $10,000,000 for American goods of this kind.

The American dairy belt is located between the 40th and 45th degree of north latitude, extending from the Atlantic to the Rocky Mountains, and possibly over them to the Pacific ocean. Within this belt are New York, Michigan, Wisconsin, Iowa, Minnesota, Pennsylvania, Northern Ohio, Indiana, Missouri, Kansas, and perhaps some other of the northern and western states and territories, including the southern parts of Canada contiguous to the United States. In this belt not more than one-third of it is adapted to dairying, as estimated by the late Professor Willard. The lands especially adapted to dairy husbandry are irregular in outline, detached, so that if they were represented on a map of this dairy belt it might resemble the appearance of islands, in some instances, upon the surface of the ocean.

The characteristics of a good dairy section are essentially the same as those of a good grazing section, which is a good, retentive soil, producing luxuriant nutritious, grasses spontaneously and indigenous thereto, with plenty of clear, soft, spring water. Natural pastures should never be ploughed, as it renders them less permanent and enduring. I have such pasture lands, and should no more think of ploughing them than I should of turning over the sod of good natural mowing. More anon on this topic.

Dairy husbandry in all ages, and every country and climate adapted thereto, has been a leading and necessary department of rural industry. Pastoral life has always been deemed one of tranquil enjoyment; and poets, ancient and modern, sacred and profane, have been eloquent in its praises and have extolled its pleasures in glowing terms. The sacred writers when addressing a pastoral people could not express their inspiration in stronger or more effective language than to indicate their meaning by exhibiting physical and moral beauty under the figurative emblems of "milk and honey." Thus was Palestine, as a pastoral country, characterized.

The nature of the soil and climate have, hitherto, determined the choice to a considerable extent between tillage and grain-growing and dairy husbandry. In sections where rich natural pasturage abound, farming industry is generally directed to the dairy rather than to tillage farming, unless market-gardening near large cities where land is dear and taxes thereon are high, be an exception. This is particularly noticeable in some parts of New Hampshire, Vermont, Massachusetts, Connecticut, New York, Ohio, Illinois, Wisconsin, and Iowa, and a portion of Canada. Some of you remember, as I do, when Worcester county, Northern Vermont, and Herkimer county, New York, were supposed to be the dairy sections *par excellence* of the States. I well remember, and that not many years since, of hearing a Herkimer county dairyman claim, in a dairymen's convention, that there was no such complete dairy section outside of Herkimer as that famous old dairy county. I cited Northern Ohio then as a good dairy section. Soon after at the Centennial Exposition, at Philadelphia—and Herkimer county was represented there—the first prize for butter was awarded to a dairyman in Iowa, and the first prize on cheese to a dairyman in the Province of Ontario, the jury awarding the prizes comprised in its number a native of Herkimer county, and he is an acknowledged expert in dairy matters, and the author of "American Dairying."

The history of dairy farming in Great Britain extends back about 700 years. The mentions of this industry are brief—hardly more than indicating that such a system of rural economy existed in fatherland; the county of Cheshire being to England what Worcester county was to Vermont, and Herkimer county to New York. In 1804, Mr. Curwen, M.P., began a dairy with purpose of supplying a neighbouring town with good milk at a comparatively cheap rate, and the experiment so far succeeded as to satisfy both producer and consumers and led Mr. Curwen to increase his business.

Mr. Curwen, before beginning a dairy for this purpose, ascertained the cost of feeding milch cows in the suburban borders of London, and found it to be two shillings per day in winter, the food consisting of seventy-two pounds (one and a half bushels) of brewers' grains, ninety pounds (two bushels) of turnips, and twelve pounds of hay. This was too expensive for Mr. Curwen, whose purpose was to produce good cheap milk at a

remunerative rate to himself. Having matured his plan, he set apart twenty-two acres of land upon which to raise green food for his cows in winter. This ground was cropped with four acres drumhead cabbage, six acres of common red turnips, two acres of Swedes, one acre of kohl-rabi, and nine acres of coleseed. The herd consisted of thirty-three head—twenty-two milch cows and the remainder were heifers. The feeding began October 1st, and was continued until May 18th. Cabbage was first fed, then common turnips, Swedes, kohl-rabi and lastly coleseed, which was found the most productive of milk. Oilcake was fed in addition, and the cost per day per cow was reported as follows: 56 lbs. of green food, 4d.; 4 lbs. of oilcake, 4d.; and 8 lbs. of straw, 1d.; total, 9d. In the following year the cows were fed 28 lbs. of green food, ½d.; 2 lbs. steamed chaff, 2d.; 3 lbs. of oilcake, 3d.; and 8 lbs. of straw, 1d.; total, 6½d. The yield of milk on this feed was an average of eight quarts wine measure per cow per day, equal to 6.6 imperial quarts. The cost of feeding a milch cow 220 days, adding cost of attendance, loss, risk, etc., Mr. Curwen estimated at £10 10s. ($52.50); produce calf, milk and manure, at £18 6s. 4d., leaving as clear profit, £7 16s. 4d.

Bela J. Stone, of Westboro', Mass., one of the oldest and most noted Ayrshire breeders and feeders in the commonwealth, has now a herd of fifty head of milch cows, bulls and young stock, from yearlings up, a large proportion of mature animals, that cost him for feed ten cents per day per head.

Mr. Stone describes his feeding stuff and the mode of preparing it as follows:

"I have a 12-horse boiler which cooks the feed and warms 16 rooms in my house. I pump water and cut my feed by steam power."

He values his feeding material as follows: corn fodder and barley straw $10 per ton; the grain at market price. Dairymen put the cost, ordinarily, per day for feeding milch cows at 20 to 25 cents and some as high as 30 cents; 20 to 25 lbs. of hay at a cent per lb., and grain 10 to 12 quarts. Mr. Stone specifically describes his process as follows:

"I cut up my corn fodder and barley straw in equal quantities. I raise my feed on my farm. I consider that I have it completely in my own hands, without buying anything for the dairy that can be raised on the farm. I let my corn fodder ripen. I raise barley and rye and let them ripen. I use straw and corn fodder cut by steam power and mixed together, and corn and cobs, barley and rye ground together and mixed in this feed. I usually cut enough in one day to last several days. In one hour, with good steam power, I can cut enough for fifty head of cattle for two or three days. This winter I take eighty pounds of this corn fodder and straw and mix it in the mixing boxes. On that I put six pails of water, and thirty pounds of barley and corn and rye meal ground together. It takes five of these boxes to fill the large steam box, making 400 pounds of corn fodder and straw and 150 pounds of meal. This is mixed thoroughly with water, taking thirty pails of water at the mixing, and ten pails of water are thrown on afterwards, to make enough for steaming. This steam box has a false bottom some six inches high with slats over it, to keep the feed up and let the water flow through. Into that I introduce the steam from 10 to 11 o'clock in the forenoon, and keep it going till feeding time at night. The grain and hay are well cooked, and are fed about four o'clock and again in the morning about half-past seven. By taking one-half of the feed at night and one-half the next morning, the whole is fed warm. Before feeding it is seasoned with salt. The cattle like it better and I think it is more valuable. In the hay tea that I have left I put seventy-five pounds of coarse shorts, and put this hay tea in the boxes under a tank and make a bran mash. I feed that seventy-five pounds among fifty head of cattle. I make a very large mass of good, sweet bran mash from that hay tea and it makes food that produces milk in abundance. I then mix this food, directly after feeding, to give to the young animals, and the cows that are giving the most milk, omitting some of the dry ones that do not need it. It costs me one cent a pound, a very low price. I then feed seventy-five pounds of meal and shorts, which cost me one cent a pound, to the best milking cows, to those cows that I want to force the most and that are giving the most milk. The young bulls I am raising to sell are not fed with bran mash. That makes three hundred pounds of grain and four hundred pounds of corn fodder and barley straw, and since the middle of November, when I began giving this steamed food, I have not fed my animals a lock of hay, except to one heifer

that had her bag so swollen that I had to take her off of steamed food and put her on dry hay to save her, and I gave her very little of that. Last year and years before I fed them with about the same results, except that I fed three times a day, giving one hundred pounds of the best English hay at noon. I gave it five hours after feeding early in the morning. This year I have omitted the hay at noon and feed only twice a day, using one hundred pounds more of grain than I ever used before, costing me about the same as the price of hay. Being short of hay, owing to the dry season, and keeping my stock through the summer, and feeding them before I began to steam the food, I reduced my quantity of hay so much that I preferred to save it till my coarse fodder is used up. I have never fed cattle at any time of year at pasture when I got as good results as from steamed food through the winter. I am making milk to sell this winter and have 21 cans a day. I am raising five or six calves, and have six or eight now that are not fed with steamed food. But I am getting more than a can of milk per cow now which calved a year ago. I have looked into the matter with men who keep dairies and have seen how their milk averages, and most of them own that they don't average an eight and one-half quart can of milk a day from the cows they are milking. Some of my cows, when they were fresh in milk, last year, gave twenty quarts a day. And as they go along, of course they give less: some of them are coming in and some are drying off. A short time ago I was getting twenty cans of milk from fifteen cows. Some of them are just drying up and none of them have been fresh since October. My steamed feed is cheaper than silage. The grain costs the same, whether they feed the silage or not, and you can look at the stock, and see which is the better system. I have looked at the stock and kept acquainted with the matter year by year. I never saw cows fed on silage have glossy hair. Everybody who has got a silo tells how much the cows eat, how much milk they give, how clean they eat it up. I cannot dispute them, for I never tried it. I am satisfied with steamed corn fodder. The steamed food gives them the sugar at the best advantage. I am satisfied to keep on and let anybody have the silo who wants it."

Mr. Stone has practised steaming his cattle feed for twelve years, and was never better pleased with it than the present winter. His stable where his stock is kept and fed is warm and well ventilated. I visited several dairy herds in Westboro', where Mr. Stone resides, but saw none with such glossy coats of hair as Mr. Stone's herd wear, a sure indication of the good condition of the cattle fed.

The subject of breeds and breeding for the dairy herd is of the first importance, not second even to that of feeds and feeding. The question is often asked by persons who are about to engage in dairy husbandry, as well as by some already engaged in the leading lucrative farm industry, "What breed of cows shall I use?" The answer to such a question must depend on conditions, such as feed and the use of the milk. If you wish to make gilt-edged butter, Jerseys and Guernseys are the breeds you want; if cheese, the Shorthorns, the Holsteins and the Ayrshires will serve you well: and if you sell your milk by the can, or if you peddle it, the Shorthorns, Holsteins and Ayrshires are the best. When the milk is to be thus sold, the Holsteins have an unequalled popularity at the present time, judging from the number imported in 1884. As to the quantity of milk, the Holsteins have no equals; so of the Jerseys and the Guernseys for butter-making.

Having determined on the breed, or breeds to be used on your farms, the next important point for consideration, is how to breed. Breeding is an art that must be learned in order to practise it successfully. If you have not done so, then pause. No one is fitted to be a successful farmer until he has learned the art of farming. An indispensable rule to be heeded is to breed from animals which have an inherent and well-ascertained type which comes of a line carefully bred and of fixed inherent qualities. Breed only from the best of the line, avoiding all misfits. Thus the desirable points are stereotyped. Such is the reward of knowledge in breeding and not the result of accident. It is said by some breeders of note that the form and action are due as a rule to the male, and the internal parts to the female. Another says, "The experience of ages has proved that the bones, tendons, nerves, and veins are from the male." The value of a cow is in her breeding. When animals of a characteristic type, such as described above, are paired, the quality of the progeny is almost sure to confirm the breeder's apophthegm, that "like produces like." Never breed from diseased or defective animals. Disraeli remarked in

his chapter on the Jews, "that it is in vain for man to attempt to baffle the inexorable law of nature, which has decreed that a superior race shall never be destroyed nor absorbed by an inferior race." The same remark will apply to the live stock of the farm. There is a difference between a breed and a race; the former is made by man; the latter is the product of nature where man has not interfered to make a change.

Heifers should come in at the age of two and a half or three years, some favouring one and some the other. Another question is started, "Is it best to raise the first calf of a heifer?" Some would and do so, and others would not, and do not. Let the example and precept of the former be heeded, rather than that of the latter. As a rule it is better to teach calves to drink than to allow them to suck, the former, as a rule, being better both for the cow and the calf. There may be exceptions.

Be sure that the bull used is bred in the line of milking stock; otherwise avoid his use if you would breed milkers. If you would breed heifers for cows take heed how the bull has been bred as to the line of milkers. Such are hints and suggestions in respect to the breeding of stock for dairy use as above indicated.

One more topic in this connection should be considered, and that is of keeping a milk record of every cow in the herd, in order to learn how much milk she gives daily and yearly. In no other way can you surely know how many cows in your herd are not worth keeping; in other words, how many cows you have, if any, which do not pay the annual cost of keeping. There are more or less in nearly every herd of this kind, and every economical dairyman should and will weed them out by the milk record, and thus in the end render dairy husbandry a profitable department of farming, as all should seek to do who engage in it. In a meeting of farmers I lately attended, this topic came up, and it was found that in a large meeting of dairymen only three or four, in answer to a question I put, keep a daily and annual milk record of their cows. Let this subject be considered by dairymen whom I have the honour and pleasure of addressing.

Breeding and feeding are inseparable; rearing means housing and feeding, comfortably housed and well fed; breeding comprises the selection of animals to breed from, both male and female, giving the greater consideration to the former. These are indispensable factors to start with, as already stated. Take care not to deteriorate these in your beginning. Select animals above the average, if you would improve the stock. If your selections be good, and your housing and feeding be all right, your stock will be creditable to your skill as a breeder. Breeds may be, as they are, improved by careful selections and skilful mating of animals. Callings, and Bates, and Booth, and Bakewell are among the most noted improvers of the cattle kind; Bakewell and Webb of sheep. A distinguished military writer on horsemanship begins a chapter on managing the reins as follows:—

"When you want to turn to the right, pull the right rein; when you want him to turn to the left, pull the left rein. This is common sense: the contrary is common error."

This should be borne in mind by breeders, who, when they wish to obtain a particular object, should take the means most likely to do so. If they want to breed a white calf, they should select a white cow and a white bull; if they want large animals, they should select large animals to start with, which are in other respects of the kind desired.

Bates, the greatest breeder of England, held the opinion that the pure Shorthorn is a distinct race of cattle, of which his own herd comprised some of the best specimens; but some of the pedigree animals, called pure Shorthorns, contained an admixture of other breeds common to England, as Devons, Herefords, Sussex, etc. A cross-bred animal is an animal whose progenitors are of two different breeds, or an animal of a recognized breed and a mongrel. A pure-bred animal is an animal whose parents are of the same breed; the term cross-bred is often used by farmers in a wrong manner—describing an animal as a cross-bred, as reflecting upon its value. This is a mistake, as a cross-bred may be a well-bred animal, while a pure-bred animal may be a very badly bred animal. A first prize Shorthorn bull mated with a first prize Hereford cow, the cross-bred would be a well-bred animal. To illustrate: A friend of mine, John S. Anderson, of Shelburne, Mass, said in a farmers' club last week that he wants a good animal to start with; would

not carry all his eggs in one basket but keep a mixed stock of Durhams and cross-breds; he desires to have heifers calve at three years old; gives calves new milk four or six weeks; has had one cow that made 20¼ pounds butter in a week; would not keep cows after they are ten years old; referred to the cow that was owned by Wm. H. Bardwell, of Shelburne, that made 500 pounds of butter in a year. The most profitable time to fatten beef is in the summer; had sold from one pasture ten head at a profit of $300; sells for beef when two and three years old; feeds milch cows what good hay they will eat and four quarts bran and two quarts cob meal twice a day; has a pair of steer calves that gained in six months and fourteen days, 488 pounds. In time of the war he sold four steers for $1,400, one pair weighing 5,000 pounds, other pair 4,400 pounds; also two heifers for $1,000, which weighed each, after arriving in New York, 2,300 pounds and 2,500 pounds.

The above statement was made by a gentleman who is a skilful breeder and feeder, one who has no peer in the Commonwealth. He has served on the Massachusetts State Board of Agriculture, and is a highly respected citizen of the old Bay State.

Prof. S. M. Barre, of Montreal, next followed with a paper on the "Methods of Butter-Making."

HOW TO IMPROVE ON BUTTER-MAKING.

1. Importance of establishing creameries.
2. Description of the different ways in which creameries are conducted, with their advantages and disadvantages.
3. What should be done to improve our butter-making?

The want of improving on butter-making is generally admitted; therefore the question naturally arises: What should we do to bring about a radical change in the manufacture of our butter in order to improve it? Amongst the means suggested for this purpose we find the following:—

1. The education of butter-makers in the private dairies.
2. The establishment of creameries.

In order to show the importance of establishing creameries in a country like this, allow me to state that the education of butter-makers in the small private dairies has been tried in countries where dairying is carried on in more favourable circumstances than this, and to prove that such a means has failed to reach and teach with effect, the average dairyman, even where labour is cheap, and circumstances are most favourable to butter-making in the small private dairies.

The countries most advanced in butter-making are Denmark, Germany, Sweden, France and the United States. Denmark has provided for the education of her dairymen and dairy-maids in the following manner:—

1. By the establishment of experimental dairy stations. In these stations experiments of all kinds are made, theories, methods and dairy appliances of all sorts are examined and tested; if good they are recommended; if bad, they are condemned.

2. By the nomination of experts and professors. In all countries where the importance of dairying is well understood, the Government keeps a staff of experts constantly employed in testing new methods as they appear, in comparing them with the old, giving to the country at large the benefit of their experiments and of the knowledge thus acquired.

3. By the nomination of consulting dairymen and teachers. Consulting dairy experts are employed. Their duties are: To study the wants of different localities, and give advice in those localities, to attend conventions and discuss the general interest of the dairy.

4. By the establishment of dairy schools. The first efforts made to improve dairying in Denmark date from 1836. In that year means were provided for the instruction of young girls who wished to work at dairying. Dairying is also taught in all agricultural colleges and also in the common schools. Besides, some twenty or twenty-five of the best dairy farms have been selected as places where those desiring it can obtain a thorough

practical instruction in butter-making. In fact all the large dairies of Denmark, keeping from 100 to 300 cows (and there are about 600 of these), take in one or two apprentices. Thus it is safe to say that Denmark possesses at least 600 first-class institutions in which butter-making is theoretically and practically taught. So that we may form a correct opinion of the efficiency of such a system of dairy teaching. Allow me to state that these 600 institutions are spread over a territory equal in size to less than half of the Province of Ontario.

5. By special exhibitions and conventions. Special exhibitions are held once or twice a year. The practical feature of such exhibitions is that in the register of the entries, and also on a card attached to every package of butter, are found indications as to how the cows were fed and how the butter was made. It is easy to see the practical utility of such proceedings. After the distribution of prizes every one attending the exhibition can see at a glance how the cows were fed, which method, and what class of dairies were the most successful.

6. By the publishing of dairy books and reports. Hand-books of butter-making, reports of lectures, conventions and experimental work are profusely distributed amongst farmers and dairymen.

7. In order to oblige dairymen to attend closely to the details of butter-making, a special register is kept in all well managed dairies. In this register are entered from day to day all items of interest concerning the milk, the cream, the quality and the quantity of the butter. The improved or inferior results obtained from different methods, or from the same method employed at different seasons, in different circumstances, etc. By thus registering the operations uniformity is obtained, and uniformity is a great thing. Prof. Sagelcke says: "The successful dairyman is he who can say that he will do to-morrow what he has done to-day." This uniformity in the operations produces uniformity in the products.

Beside providing by every possible means for the education of dairymen, the following agencies were used to enhance the butter-making industry of Denmark:

1. The use of methods to suit the markets in which they intend to sell. To do this two kinds of butter are made in Denmark—one kind goes to Brazil and other hot countries, the other is shipped to England. The kind made for the tropical countries is a long-keeping article. The other kind shipped to England is more aromatic but does not keep so long. Germany, France and the United States follow the same principle. Germany makes mostly for the British market. France makes two kinds of butter—one kind to be consumed at once, the other kind to be kept longer.

As a rule, our American friends make mostly to suit the local trade, and generally they succeed admirably well. This proves that the theory so often propounded that good butter is good butter, and will suit the requirements of any market, is a false one. It would not do to ship to Brazil butter which would be considered good in Toronto, because it would be bad before reaching its destination.

2. The establishment of packing-houses. Special packing-houses have also been established in different parts of Denmark. To these the butter from many of the small dairies is brought twice a week. It is classified, packed and paid according to its quality.

3. The making of arrangements to facilitate the shipping of butter in a fresh state. Twice a week butter cars are placed on railways leading to packing-houses, cities and sea ports. Thus semi-weekly shipments are made from the dairies in the best of conditions.

4. The establishment of large private dairies, and the establishment of creameries. One would think that after the many and persistent efforts made to spread a thorough knowledge of dairying in Denmark, after the lavish expenditure of money made for this purpose, an expenditure that in 1883–4, for experimental work only, amounted to $30,000. I repeat one would think that it would be almost impossible to find a person engaged in agricultural pursuits who was not fully competent to make first-class butter.

Still what is the truth? It is useless to hide it. On four-fifths of the small dairy farms, the butter produced is very far from being what it should be. The proof of this is, that it sells for 5, 8 and oftentimes 12 cents per lb. less than that made in the large dairies.

If after thirty or forty years of intelligent and energetic work, if also using the

resources of its most admirable system of dairy teaching, if after employing the numerous agencies which we have described, Denmark has to a great extent failed to improve butter-making in most of its small dairies, allow me to ask you how many hundred years will it take to reform butter-making in a country as large and sparsely settled as Canada, where, comparatively speaking, so little is done towards its improvement, and where butter is nearly all made in small private dairies.

No longer back than two or three years ago, the very question I am treating now, that is, "How to improve butter-making in the small private dairies?" was the subject of discussion in the Danish press, and also in meetings of this kind held in Denmark. Then, it was said, that the time of apprenticeship served in the schools and in the dairies was far too short, and that in consequence the education of dairymen and dairymaids was far from being up to the requirements of the times. The butter dealers complained loudly that the butter from the small private dairies lacked in uniformity, keeping quality, etc., etc.

Amongst the means suggested to remedy these defects was the superseding of the small private dairies by creameries.

It seems that this last suggestion was acted on to a great extent, for we read in a report of Consulting Expert Yesren, published in 1884, that a considerable number of creameries (or co-operative dairies) were established in Denmark in the year 1883.

Desiring to obtain some reliable information on this subject, on the 23rd of April, 1884, I wrote to the editor of the *Ugeskrift for Landmeand*, a journal devoted to the agricultural and dairy interests, published in Copenhagen, and in the first days of June, I received an answer, of which the following is the substance:—

He was unable to state exactly the number of creameries in Denmark, Sweden and Germany. They were, however, steadily increasing. Some had failed, but the greatest number had succeeded and were holding their own. In answer to the question, What he thought of the establishment of creameries, he stated, that in localities where butter-making was not properly understood nor practised, it was more profitable for the farmer to abandon the manufacture of butter and leave it to the creamery. On the contrary, if the farmer was competent to make good butter, it was more profitable to make it himself. It is well to remark that our conditions and those of Denmark are not identical.

In Denmark farm help is plentiful and cheap; here it is the reverse. It is, therefore, evident that in the case of small dairies, it would always be more profitable for a Canadian farmer to leave butter-making to the creamery.

In Denmark we find about 600 dairies keeping from 100 to 300 cows: these, it is evident, make butter as a business, and therefore make it good.

There are 4,000 dairies, keeping from 20 to 66 cows. It is evident that to these, also, the making of butter is of primary importance. There are 70,000 others, of which 30,000 keep less than seven cows. The butter made in these never ranks high.

Thus we find that one-third of the quantity of butter made in Denmark comes from the large dairies. To this one-third Danish butter owes it reputation and success.

From what precedes, it is evident that the reputation of Danish butter has been built up principally by large private dairies; and that any attempt to educate the whole agricultural population of a country up to a high standard of excellence in butter-making can only be attended with failure.

Germany follows Denmark's example and goes in for the establishment of large dairies, either private or co-operative. In the different Provinces of Germany (excepting Bavaria) we find 92 dairies conducted on the co-operative plan, disposing of the milk of from 50 to 2,000 cows. In the Province of Bavaria alone there are at least 900 co-operative dairies and creameries, working about 1,000 lbs. of milk per day. Co-operative dairies and creameries are also found in Sweden, Ireland, and elsewhere. This is more than sufficient to prove that the establishment of creameries is the best plan of improving our butter-making.

Creameries.

We shall now state according to what plan creameries are managed. Two plans are used—1st. The cream gathering; 2nd. The centrifugal.

The main feature of the cream-gathering system is that each farmer sets the milk in deep vessels of uniform size and shape in his own dairy. It is skimmed by the cream-gatherer, who is employed and sent daily by the creamery.

Round, oval or conical shaped deep cans may be used for setting the milk; but farmers sending cream to one creamery should all have vessels of same size and form. In the side of the can, two or three inches from the top, is fixed a glass graduated scale. This scale, graduated in inches and parts of inches, indicates the dividing line between the cream and the skim milk, and enables the cream gatherer to see at a glance the thickness of cream, and to measure the quantity to be credited to the account of each farmer.

A creamery of this kind has been successfully established at the Guelph Agricultural Farm. A very important and interesting report of the workings of this creamery was given by Prof. W. Brown before the meeting of the Western Dairymen's Association a few weeks ago. But the creamery having been worked thirty-three days only, the result cannot be accepted for a base of operations during a whole season.

The advantages of the cream-gathering system are these:—

1. It is very economical, as it saves the drawing of milk to and from the creamery.

2. The creamery building need not be expensive. A good creamery of 500 cows could be built and equipped for about $1,600.

3. The cream can be collected over a much larger territory than it would be possible to carry the milk if delivered at one factory.

4. The dairyman or farmer generally realizes considerably more than he would were he to manufacture butter on the farm, and sell it on his own account.

The disadvantages are these:—

1. The cleanliness and temperature of 300 (and even more) dairies are not generally uniform. Again, some dairies will use ice, while others will use water at varying degrees of temperature, as cooling mediums. Therefore the milk set in all these dairies is set in different conditions. This want of uniformity injures the quality and diminishes the quantity of the butter.

2. In the best circumstances, that is, when all the farmers use ice water at 33° Fahr., and the milk is set thirty-four hours, this system gives about 14 per cent. less butter than the centrifugal. Milk is now set ten or twelve hours at a temperature ranging from 45 to 55° Fahr. and over.

3. Owing to the milk being set in different conditions as to temperature, etc., the cream so obtained varies very much in density, therefore it is very difficult to measure it accurately, and do justice to the patrons.

4. In the fall of the year, when milk is "heavy," this system offers difficulties not generally understood. When the milk is "heavy" there is sometimes no distinctly marked line between the cream and the skim milk, consequently its measurement would be a difficulty of the most serious kind.

Milk should be set in ice water at about 33° Fahr. at least twenty-four hours. The use of ice would, I believe, greatly improve the cream-gathering system. More butter would certainly be obtained from a given quantity of milk, and the milk being set at a more uniform temperature would naturally yield cream of a more uniform density, and its measure would to a certain extent be more accurate.

The cream-gathering system may be used with advantage in thinly settled sections or sections where the herds are small.

The mechanical process consists in depriving the milk of its cream by centrifugal force. Centrifugal force is a force of nature, by which an object revolving around a given centre is continually trying to break away from that centre. If the object which is revolving is a vessel containing a liquid composed of elements of different weight, such as milk, these elements will separate and arrange themselves according to their weight: the heavier ones will be further from the centre, the lighter ones nearer.

Milk, as already explained, is a liquid containing elements of unequal weight, namely: cream and a watery liquid somewhat heavier; therefore if milk is placed in a vessel which is made to revolve, it is evident that the cream, the watery liquid, and any impurities the milk contains, will separate and form three distinct rings. The impurities

being heaviest will form the outside one, the skim milk will form the next, and the cream being the lightest of all will be closest to the centre. This is the principle upon which all centrifugal separators are constructed ; the differences between them, are differences of detail.

During the last three years five large centrifugal creameries have been successfully established in the Province of Quebec, and two in Ontario. The first centrifugal creamery of Canada, and perhaps of America, was established in the spring of the year 1882, by a public-spirited gentleman of Beauce, Mr. H. J. J. Duchesnay. We will give a report of the quantity of milk required to make a pound of butter at Mr. Duchesnay's creamery during the season 1884. This creamery works the milk of about 450 cows.

From June	the	16th	to June	the	30th	22.52	lbs.
"	"	" 30th	to July	"	15th	22.28	"
" July	"	16th	to "	"	31st	21.70	"
" Aug.	"	1st	to Aug.	"	15th	20.23	"
"	"	" 16th	to Sept.	"	1st	20.05	"
" Sept.	"	1st	to "	"	15th	19.21	"
"	"	" 16th	to "	"	30th	19.20	"
" Oct.	"	1st	to Oct.	"	17th	19.18	"

On September 24th it took 18.88 pounds of milk to make a pound of butter.

The centrifugal system offers the following advantages :—

1. It allows of the transportation of milk to the factory but once a day ; thus half the cost and trouble of milk transportation is saved.

2. It saves space. The space covered by a centrifugal is very small, not on an average more than twenty inches by six feet for the small size, and three and a-half feet by eight for large sizes.

3. It saves time. By this system 10,000 pounds of milk will yield its cream in four or five hours ; while by any other system, to yield considerably less cream it would require from twenty-four to thirty-six hours.

4. It saves water and ice. With this system, water is used only for washing butter, cleaning purposes and for the engine. It must be remembered that with this system only the cream is cooled, while with other systems, the whole mass of milk and cream has to be cooled. Instead of cooling 100 pounds of milk the dairyman cools twenty pounds of cream only.

5. By it the milk is saved from exposure to impure air, and to atmospheric changes.

6. It saves labour.

7. It gives a perfectly sweet cream in large quantities (two milkings can be skimmed at a time). This cream, uniformly fresh, can be soured to suit the requirements of the different markets.

8. It gives a greater yield of butter. The latest experiments of Mr. Fjord show that the centrifugal system gave during twelve months an average of twenty-three per cent. more butter than the "Ice ten hours," fourteen per cent more than the "Ice thirty-four hours," forty-one per cent. more than the "Water at fifty Fahr.," fourteen per cent. more than the "Pans thirty-four hours," and seven per cent, more than the "Churning of milk."

9. It will skim the milk of all different breeds, at all seasons, more completely than any other system. Some very strange and yet important facts have been lately brought to light by Prof. W. Brown, of the Guelph experimental farm. This gentleman, who is so well and favourably known, has already demonstrated that when Ayrshire milk would give five per cent. of cream by deep setting the same milk would give nearly ten per cent. by the centrifugal. This shows that a very large proportion of Ayrshire cream remains in the skim milk when such milk is treated by the deep-setting method. It will skim "heavy" milk, or milk from long-calved cows, more efficiently than all the other systems. It will give about twenty-six per cent. more butter than the next more favourable method. When we consider that with the present system of cream-gathering the milk from different breeds is treated alike and that it is set at all seasons in deep vessels ten or twelve

hours only, at a temperature ranging from forty-five to fifty-five Fahr., and over, it makes evident that in many sections of this Province, and of this country, the surplus of butter obtained through the centrifugal system would more than pay for the drawing of the milk to the factory once a day.

10. It gives a better quality of butter. However carefully the milking and straining have been done, the centrifugal extracts from the milk and cream, and consequently from the butter, a large amount of impurities, which older methods could not remove.

Disadvantages of the system may be enumerated as follows :—

1. It requires more outlay for plant. When large centrifugal separators are used (or two small ones) and steam power is required, the running expenses are somewhat greater than with older methods.

2. The larger the dairy, the less expense comparatively speaking. For very large co-operative creameries, the running expenses are not greater than by other methods (if we except the cream-gathering system). Therefore, this system is the best adapted to large, private and to co-operative or public dairies.

Amongst the objections often raised against the establishment of creameries, we find:—

1. It is necessary to draw the milk twice a day. With the Fairlamb method milk is not brought to the factory at all. The centrifugal separator, which has been in operation three years in this country, does away with this difficulty altogether.

2. According to a dairy writer, the greatest objection to the creamery system is the general practice of estimating rich and poor milk alike, making the same returns to patrons, for equal quantities of each, which is manifestly unjust. The same writer adds, that the objection will in time be completely obviated. Some of the managers of the cream-gathering system in the Western States have adopted successfully a more exact method of distributing proceeds, and it is hoped and believed that all will in time follow the same course. We may add that with the centrifugal this objection will also disappear altogether. Prof. Fjord's centrifugal milk-controller indicates in an exact manner the quantity of cream contained in different milks, and allows of the patrons being paid in proportion to the richness of the milk and not in proportion to its weight.

3. The best butter is made in the private dairies, because the feeding and the milk is more directly under the control of the operator. It is true, that some of the best butter for immediate consumption is made in a few of our private dairies ; but it must not be forgotten that it is also true, that all the bad butter comes from the private dairies, while it is certain that creameries produce a good butter. If by accident a creamery should produce bad butter, it could not make it long—it would soon be obliged to stop.

4. Another objection is, that after many years of co-operative dairying in the United States and Canada, the largest proportion of butter comes from the private dairies. This simply means that co-operative dairying is not a child of rapid growth. It is true, but like all healthy children it is a child of steady growth.

In order to improve butter-making the following means should be employed :—

1. Establish an experimental dairy station.
2. Encourage the establishment of creameries by all means.
3. Let the best creameries be used as dairy schools.
4. Disseminate sound practical information on the subject of butter-making, and show the farmer the immense loss incurred by the making of bad butter.
5. Organize special exhibitions, and let them be as practical as possible.

A Member.—I can get cream from my milk in deep setting without water, but cannot when water is employed.

Prof. Barre.—You can get cream in any agency for cooling—ice, cold water, or air. Your cows are new milch cows, probably, and sometimes we find a difference between the milk of a new milch cow an an old one.

A. Member.—Some have found it beneficial in the fall of the year to allow the cream to rise before setting in the ice-water, and have received more cream from the milk.

The hour of adjournment having arrived the Chairman left the chair, and the session was resumed in the evening.

POULTRY HUSBANDRY.

Prof. WETHERELL made a few suggestive remarks on "Poultry Husbandry." He said that in Boston market they had a report every day in the daily papers on the egg market, and it always gave the Canada eggs. He remarked that it was the worst furnished market in eggs of any in the place. He did not know whether it was the fault of the egg producer or of the egg only. He said that the contractors were women, and that the regular contest between them and the farmers who produce the eggs was as sharp as that between the buyers of butter and cheese and the producers. A young man whose father produced milk for the Boston market, became so disgusted that he determined to "go west." His father persuaded him to go into the poultry business, and offered to furnish the capital. The young man started with 100 hens, and now he counts them by the thousand. He had done a great deal better in the egg business than his father ever did in the milk business. Milk is used in preparing feed for the fowls. He had made a "specialty" of eggs because it was the most lucrative branch of the poultry husbandry. The chickens were sold at very high figures—some at $3 a pair. There were few who could afford to have them, but people who wanted a good thing were willing to give that price rather than not get them. The eggs were always ready for the market and the best breeds of fowls taken to get the highest prices. In that way a great success had been made. That young man did not claim to make $5 or $6 to the hen, but he did average $2; keeping 3,000 would make a handsome income. It was pleasant work if one knew how to do it. Many had lost all that they invested in the fowls because they took such slovenly care of them. A hen-house should be built of seasoned hemlock lumber from six to ten feet above the ground, twelve feet wide, and spikes on the walls, with a glass front running out in the yard from twelve to fifteen feet so that every department of the fowls could run out and take the air. This would help to keep cleanliness and healthy poultry. A warm southern exposure was best to promote early laying. The feeding also had something to do with the laying. Fowls should be fed early in the morning; they liked an early breakfast. Screenings, with cracked corn and meat, stimulated good producing qualities. The professor asked a grocer if he had eggs enough brought in to supply his trade, and received a reply in the negative. He concluded by saying that the farmers made a great mistake in not keeping more fowls, because if properly taken care of, and it need not take up much of their time, it would become very profitable.

The next speaker introduced was Prof. J. B. Harris, of Antwerp, N.Y., who read a paper on "Dairying in Scotland." [It is printed in the Western Association's Report.]

BRIEF ADDRESSES.

Dr. ANDERSON, of Winchester Springs, was called upon to make a few remarks. He said that it afforded him very great pleasure to be present, and that the Chairman and members of the Association might justly be termed public benefactors. The agriculturists of this country form seven-tenths of the community, and their success means the success of every other calling. There are different avenues to trade in connection with agriculture, and through them every other line of business is made prosperous. A farmer's occupation is one of the most honourable that a man can follow. He should study theoretically and practically, taking those journals which treat on general farm and dairy work so as to be enabled to carry on the operations of the farm in an intelligible and profitable manner, being capable alike of receiving instructions from other farmers, and contributing in no small degree his own quota to the general store of knowledge. It is a great thing to know how to utilize the modern appliances, and farmers should keep abreast of the times. It is said of the *habitans* of Lower Canada that they will not take up with any "new fangled" ideas; they are going to perpetuate the old method of driving oxen by the horns because their fathers had done so. Attention should be given to the making of a successful market for products. It is a sad fact that farmers sometimes work hard, and after accumulating a large stock of butter and cheese lose on it for want of a good market. The speaker advised his hearers to keep a thoroughbred rather than a grade, as it is just as cheap to keep a good cow as a poor one.

Mr. WELD, of the *Farmers' Advocate*, London, enlivened the audience with a few humorous remarks and was followed by—

Mr. M. K. EVERETTS, who gave some practical remarks about dairying. He said that they owed a debt of gratitude to the cheese instructors of Eastern Ontario, viz., Profs. Harris, Arnold, and Messrs. Whitton and Bissell—a debt which he was afraid they would never be able to repay—for the very satisfactory manner in which they had conducted their business, and for the general instruction they had imparted. In reference to the manufacturers, the proprietors had not met with that sympathy they should have from the farming community. The President appeared to be very hard upon the small buildings. He knew from experience, having been in the cheese business some length of time, and having conducted four or five factories, that to put up such buildings, as indicated, together with the machinery, would not cost less than from $1,500 to $2,000, and it was not within the means of every one to erect such buildings, however desirable the object might be. He concluded by urging the farmers to put forth every effort to enhance their value as producers, inasmuch as the use was always in excess of the demand.

The subject of the Lactometer was briefly touched upon, and it was observed that steps should be taken by the Association to have it legalized by our Government, so as to have it act in the capacity of witness in any cases of litigation.

CLOSING WORDS.

President Derbyshire remarked in closing the Convention that it had been the best one he had ever attended. He expressed his thanks to the people of Morrisburg for the kindness shown, and his gratification at the way the farmers of the vicinity had come out. He thanked the Convention for the honour they had done him personally in re-electing him to the presidency of the association, and would in the future, as he had in the past, do all he could to further the interests of the Association.

Mr. Ira Morgan moved, seconded by Mr. James Bissell, that a vote of thanks be given to the Committee of Management, and the residents of Morrisburg and its vicinity, for the great interest they have taken and manifested by their attendance at the meeting in connection with this Convention.—Carried.

Mr. Bissell moved, seconded by Mr. McCrae, that thanks be tendered to the ladies for their presence at this Convention.—Carried.

Mr. Daly moved, seconded by Mr. Haggarty, that a vote of thanks be tendered to the reporters of the press for the assiduous attention they have given in reporting the proceedings of this Convention.—Carried.

Mr. Walker moved, seconded by Mr. Vandewaters, that a vote of thanks be tendered to the different speakers who have taken part in this Convention.—Carried.

Mr. Morgan moved, seconded by Mr. Everetts, that a vote of thanks be tendered to the different railways for giving us reduced fares.—Carried.

Mr. Ashley stated that if they were to turn out in larger numbers, instead of getting the double fare reduced, they could procure it for one single fare. The attendance had not been sufficient hitherto to warrant them in issuing tickets at a lower price.

Mr. Walker moved, seconded by Mr. Bissell, that this Association act in conjunction with the Western Dairymen's Association to ask the Ontario Government to pass an Act regarding the adulteration of milk.—Carried.

At this juncture President Derbyshire was asked to vacate the Chair and Mr. M. K. Everetts was called on to take it. A vote of thanks was then moved to the President for the efficient manner in which he had presided. Mr. Everetts put the motion with a few appropriate remarks, and the large audience responded in an unanimous standing vote.

The Convention then adjourned.

LIST OF NAMES OF THE MEMBERS OF THE EASTERN DAIRYMEN'S ASSOCIATION OF ONTARIO, WITH THEIR POST OFFICE ADDRESS, FOR THE YEAR A.D. 1885.

Name.	Post Office.	Name.	Post Office.
Allison, A., Jr.	Dunbar.	Clark, James	Chapman.
Aylsworth, C. F	Madoc.	Caskey, John	Madoc.
Aspley, Harford	Foxboro'.	*Courier*	Trenton.
Alexander, James	Brockville.	Cummings, Wm. J	Spencerville.
Alguire, Wm	Cornwall, Centre.	Cook & Son, M	Aultsville.
Anderson, W. J	Winchester Springs.	Campbell, Wm	Brownsville.
Advocate	Trenton.	Chamberlain, Dr.	Morrisburg.
Anderson, Alex	Campbellford.	Campbell, A	Ormond.
		Cassellman, Charles	Morrisburg.
Bigger, E. B	Montreal.	Colguham, G. D	Cornwall.
Bissell, James	Algonquin.	Carwyle, Thomas	Dunbar.
Bissell, H	do	Campbell, Bower	Harper's Corners.
Bissell, Charles	do		
Brown, J. C	Williamsburg.	Doran, John	Morrisburg.
Blucker, Henry	Frankford.	Duncan, James	Wellman's Corners.
Bell, Prof	Belleville.	Daily, P. R	Foxboro.
Brenton, F	Foxboro'.	Deprose, W. R	Peterboro'.
Bird, James	do	Derick, Angus	Merrickville.
Bradley, Wesley	Halloway.	Derbyshire, Dr.	Brockville.
Boardman, M	Foxboro'.	Dickson, W. C	Lancaster.
Benson, Richard	Picton.	Dawson, John	Bell's Corners.
Bennett, L. J	Spencerville.	Dingwell, James	Williamstown.
Bird, Morden	Wallbridge.	Dillen, George	Morrisburg.
Byers, W. H	Morewood.	Drummond, James	Keene.
Bissell, Wm	Algonquin.	Daugharty, Pembrok	Osnabruck, Centre.
Black Bros	Brockville.		
Bowen, Charles	Dixon's Corners.	Everetts, M. K	Easton's Corners.
Breckenridge, D. A	Morrisburg.	Edgar, William	South Mountain.
Boton, Peter	Fulton.	Ensigh, Brighton	Brighton.
Review	Peterboro'.	*Enterprise*	Cobourg.
		Examiner	Peterboro'.
Cassellman, Geo	Morrisburg.	*Express*	Cobourg.
Carscallion, A. W	Marmora.		

List of Members—*Continued.*

Name.	Post Office.	Name.	Post Office.
Fulton, R. D.	Winchester.	Kenzie, William	Morrisburg.
Farley, J. M.	Belleville.	Knowlan, John	Canetown.
Foster, Silas	Brenston Corners.	McConkey, James	North Williamsburg.
Farling, Alex	Morrisburg.	McLavish, J	Van Camp's Mills.
Grimmerson, John	Grafton.	Murkley, James H	North Williamsburg.
Gilroy, C. J	Glen Bwall.	Markill, Elias	Wales.
Guile, George	Brockville.	Marshall, E	Gallertown.
Gardiner, Frank	Winchester, North.	Morehouse, Henry	South Mountain.
Gibbons, J. F	Morrisburg.	McDonald, Thomas	Morrisburg.
Groves, James L.	do	McIntosh, Peter	West Winchester.
Graham, G. P		Manhart, G. A	Brockville.
Guide	Port Hope.	McClennan, D.	Cameron.
Hawley, J. C	Read.	McGregor, Jas	The Ridge.
Haggerty, James	West Huntingdon.	Murphy, P	Stoco.
Hinman, P	Grafton.	Moore, J. W	Peterborc.
Hariety, John	West Huntingdon.	Mallory, A. W	Mallorytown.
Howard, L. W	Morrisburg.	Miller, Thomas J	Spencerville.
Housan, Robert	Utica.	Murphy, A	Kempville.
Hamilton, J. S	Foxboro'.	Miller, Jas	Spencerville.
Hunt, Martin	Lynn.	May, William	Maitland.
Hickey, J. S.	Aultsville.	McCrea, W. R	Brockville.
Hollister, Jacob	Osnabruck, Centre.	McGammon, J. J	Morrisburg.
Harris, J. B	Antwerp.	McKinnon, D. P	South French.
Hogaboom, Benjamin	Farmersville.	McFarland, Peter	Kelso, Quebec.
Herald	Campbellford.	McIntosh, Ira H	Dundula.
Irvin, William	Emery Corners.	McCrea, George	Maitland.
Jackson, John	Gananoque.	McDonald. C. C	Wicklow.
Johnson, Geo. S	Chyster.	McPherson, D. M	Lancaster.
Kendrick, S. M	Dunbar.	McClennan, A. B	do
Kidd, Edward	North Gower.	McClennan, Kenneth	do
Kavangh, Dr	Umfraville.	McClennan, D. B	do
		McNish, J . B	Brockville.
		McVickie, John D	Curry Hill.

List of Members—*Continued.*

Name.	Post Office.	Name.	Post Office.
Mathison, C. A	Perth.	Robertson, Sandey	Morrisburg.
McLees, Hon.—	Fallbrook.	Russell & Co., John	Ingersoll.
Messenger	Millbrook.	Rae, John	Case's Bridge.
Moodie, James	Chesterville.	*Register*	Norwood.
Morland, John	Sydenham.	*Star*	Hastings.
Morgan, Ira	Metcalfe.	*Statesman*	Bowmanville.
McIntosh, D. J	St. Raphæl's.	*Sentinal-Star*	Cobourg.
Moorehouse, Thomas	Morrisburg.	Shaver, Morris	Neivington.
Montgomery, Eli	Lockfield.	Struter, Alonzo	Aultsville.
Morgan, A. J	Inkerman.	Soper, H. L	South Mountain.
Millray, R. R	Cornwall Centre.	Smith, Jas. W	Aultsville.
Miller, J. F	Morrisburg.	Sprague, M	Ameliasburg.
Mathews, E. C	do	Stowell, C	Addison.
Marsellis, J. S	Box Hill.	Seman, Parker E	Frankville.
McMullen, John E	Seely's Bay.	Stevens, Wm	Glen Buell.
Maskell, Alvin S	Lunenburg.	Snider, J. C	Brouseville.
Newton, Dr. (*News*, Bowmanville)	Deseronto.	Spencer, S. L	South Dummer.
		Summers, Alex	Aultsville.
Orillia Packet	Orillia.		
Prentes, B. B	Morrisburg.	Tait, P. M	Mille Roche.
Purvis, Arthur P	Lyn.	Taché J. de L	St. Hyacinthe.
Parker, F. B	Stirling.	Tracey, G. C	Archer.
Pelton, David	Burrit's Rapids.	Thompson, Wm	Madoc.
Payne, L. R	Warsaw.	Taylor, Warren	Warsaw.
Payne, George S	do	Thompson, H. H	Pittston.
Park, M. E	Cornwall.	Tuttle, Rebben	Iroquois.
Palmer, Ezra	McIntosh Mills.	*Times*	Port Hope.
Publo, Mr	Perth.	Utman, N	Moira.
Phillips, Samuel	Baltimore.	Vankamp, Ashley D	Prescott.
Rudderick, J. A	Huntingdon.	Vanallen, Abraham	Morrisburg.
Rose, Alex	Van Camp's Mills.	Vermilyea, N	Belleville.
Robinson, M	Thomasburg.	Vandewater, D	Foxboro.

List of Members—*Concluded.*

Name.	Post Office.	Name.	Post Office.
Vandervoot, W. B	Belleville.	Washburn, L. H	Soperton.
Wood, Frank	Morrisburg.	Williams, W. H	Greenbush.
Webb, S. H	Prescott.	Whorry, Robert	Iroquois.
Wilmott, S. F	Wallbridge.	Wood, William	Avonmore.
Wilson, John	Stirling.	Williams, H. M	Picton.
Wade, Henry	Toronto.	*World*	Cobourg.
Whitton, James	Wellman's Corners.	Wetherell, L	31 Allen St., Boston, Mass.
Walker, Thomas	do		

(No. 74.)

Return of copies of all applications made to the Provincial Government for aid to Railways since the passage of the Dominion Act of 1883, declaring Provincial Railways to be for the benefit of Canada, with copies of all correspondence relating to such applications. (*Not printed.*)

(No. 75.)

Return of all correspondence between the Crown Lands Department, or any officer thereof, and any other person, with reference to the dues charged by timber limit holders to actual settlers upon lots on which they have not been formally located. (*Not printed.*)

RETURN

To an Address to His Honour the Lieutenant-Governor dated March 14th, 1884, praying that he will cause to be laid before the House, a Return of copies of all Orders in Council passed under the authority of the General Mining Act, creating, extending, adding to or diminishing mining divisions.

By Command,

ARTHUR S. HARDY,
Secretary.

Provincial Secretary's Office,
Toronto, March 25th, 1884.

COPY of an Order in Council approved by His Honour the Lieutenant-Governor, the 5th day of May, A.D. 1869.

His Excellency the Lieutenant-Governor in Council was pleased to order, and it is hereby ordered, that the following tract of country be and is hereby declared a "Mining Division," under "The General Mining Act of 1869," to be called "The Lake Superior Mining Division," namely, all that tract of country lying within the following limits or boundaries, that is to say: commencing at a point where the parallel of eighty-four degrees of west longitude intersects the boundary line between the United States and the Province of Ontario, thence along the said boundary line northerly and westerly through the River St. Mary and Lake Superior to the mouth of Pigeon River, thence westerly along the boundary line of said Province to the height of land, thence north-easterly and easterly along the height of land to the said parallel of eighty-four degrees of west longitude, thence south along the said parallel to the place of beginning.

Certified,

J. G. SCOTT,
Clerk, Executive Council, Ontario.

COPY.

GOVERNMENT HOUSE, TORONTO,
Saturday, the 11th day of September, 1869.

Present: His Excellency the Lieutenant-Governor in Council.

His Excellency the Lieutenant-Governor in Council was pleased to order, and it is hereby ordered, that the tract of country composed of the Townships of Hungerford, Elzevir, Madoc, Marmora, Lake, Tudor, Grimsthorpe, Cashel, Limerick and Wollaston, in the County of Hastings; the Townships of Belmont and Methuen in the County of Peterborough; the Townships of Kaladar, Anglesea, Effingham, Ashby, Denbigh and Abinger, in the County of Addington, and the Townships of Barrie and Kennebec, in the County of Frontenac, be and is hereby declared a "Mining Division," under "The General Mining Act of 1869," to be called "The Madoc Mining Division."

COPY.

COPY of Minute of Council approved by His Excellency the Lieutenant-Governor, the 11th September, 1869.

The Committee of Council have had under consideration the Report of the Honourable the Commissioner of Crown Lands, dated this day, in which he recommends that the tract of country composed of the Townships of Hungerford, Elzevir, Madoc, Marmora, Lake, Tudor, Grimsthorpe, Cashel, Limerick and Wollaston, in the County of Hastings; the Townships of Belmont and Methuen in the County of Peterborough; the Townships of Kaladar, Anglesea, Effingham, Ashby, Denbigh and Abinger, in the County of Addington, and the Townships of Barrie and Kennebec in the County of Frontenac, be declared a Mining Division, and that for that purpose an order should be made by Your Excellency in Council, in the form and to the effect set forth in the accompanying draft thereof.

The Committee concur in the recommendation of the Honourable the Commissioner of Crown Lands, and advise that the same be approved of and acted upon.

Certified,

JAS. ROSS,
C. E. C.

Executive Council Chamber,
Toronto, 11th September, 1869.

REPORT

Of the Secretary and Registrar of the Province of Ontario for the year ending 31st December, 1884.

By Command.

ARTHUR S. HARDY,
Secretary.

PROVINCIAL SECRETARY'S OFFICE,
TORONTO, 25th March, 1885.

REPORT

OF THE

SECRETARY AND REGISTRAR

OF THE

PROVINCE OF ONTARIO

FOR THE YEAR ENDING 31st DECEMBER, 1884.

To His Honour

THE HONOURABLE JOHN BEVERLEY ROBINSON,

Lieutenant-Governor of the Province of Ontario:

MAY IT PLEASE YOUR HONOUR:

The undersigned respectfully begs to submit for the information of Your Honour and for presentation to the Legislative Assembly, a Report with respect to the transactions of the Department of the Secretary and Registrar of the Province of Ontario for the year ending 31st of December, 1884.

The Register in the Secretary's office shows that during the year three thousand five hundred and forty-three new subjects were under consideration, and that in connection therewith five thousand five hundred and sixty-seven despatches and letters were received, and five thousand three hundred and thirteen despatches and letters sent out.

With a view to the further consideration of certain of these subjects, two thousand three hundred and eighteen references were made to other departments of the Government, from which one thousand two hundred and fifty-seven reports with respect thereto were received and acted upon.

In addition to the above, many letters were received and others written and references made with respect to subjects entered in the registers for previous years.

During the year there were issued from the Secretary's office—

(1) Thirteen thousand three hundred and ninety-five marriage licenses, five hundred and thirteen marriage certificates, and thirteen thousand nine hundred and eight affidavits; in all twenty-seven thousand eight hundred and sixteen Marriage Act forms.

(2) One thousand seven hundred printed forms distributed to sheriffs for the purpose of expediting the examination and removal of lunatics from the county gaols to the various asylums.

(3) Two thousand nine hundred printed forms to enable municipal clerks throughout the Province, the Secretaries of Joint Stock Companies incorporated prior to 1885, the

Registrars of deeds, and other county officers, to make the statutory returns required of them respectively.

(4) Two hundred and seventy-two warrants for the removal of lunatics from the gaols to the asylums.

(5) Eighty-one warrants for the discharge from the asylums of patients whose restoration to a state of sanity had been duly certified by the Medical Superintendent in charge.

(6) Ninety-one notarial certificates; and

(7) Several hundred circulars.

During 1884 the appointments of 481 persons to office were gazetted.

Ten proclamations by Your Honour were also gazetted. Of these, the more important were issued for the purpose of—

(1) Bringing into force 47 Victoria, chapter 2, being an Act respecting the Territory in dispute between this Province and the Province of Manitoba.

(2) Forbidding trespassing upon the lands of the Crown in that part of Ontario lying to the west of a line drawn due north from the confluence of the Ohio and Mississippi Rivers; and

(3) Bringing into force 47 Victoria, chapter 14, being an Act respecting the District of Algoma and Thunder Bay, by which the Territorial District of Thunder Bay was erected into a temporary judicial district, and Port Arthur named the district town. Since this proclamation was issued, a judge and other district officers have been appointed.

In the *Ontario Gazette* twenty-one proclamations issued by His Excellency the Governor-General with respect to the submission of The Canada Temperance Act in various municipalities were published in accordance with the requirements of that Act.

One hundred and seven public notices with reference to the grant of charters to joint stock companies, and for other purposes, were also gazetted.

More than three thousand statutory returns were received by the Department and acknowledged and fyled away. By the Act 47 Victoria, chapter 10, section 16, assented to March 25th, 1884, all returns with respect to the fees received by Sheriffs, Local Masters, Local Registrars, Deputy Registrars, County Crown Attorneys, and Clerks of the Peace will in future be made to the Inspector of Legal Offices instead of to this office.

Incorporation by Letters Patent issued under the Revised Statutes of Ontario, Chapter 150, was granted to ninety-three Joint Stock Companies. Elsewhere will be found a list of these companies, whose capital in the aggregate exceeds ten and one-half millions of dollars.

By-laws increasing the capital stock of nine companies, previously incorporated, were confirmed by the issue of Supplementary Letters Patent.

The names of four companies were changed, three by Orders of Your Honour in Council under the Revised Statute of Ontario, chapter 172, and one by Supplementary Letters Patent under the Revised Statute of Ontario, chapter 150.

Sixty Returns to Addresses and Orders by the House were presented to the Legislative Assembly during the Session of 1884.

The fees received during the year at the Secretary's office amounted to $7,299.

The following is a comparative Statement for the years 1868, 1881, 1883 and 1884, shewing the work done in the Secretary's Office.

Work Done.	1868.	1881.	1883.	1884.
Number of fyles as shewn by Office Register	1,172	2,408	3,336	3,543
Letters received	2,107	4,162	5,586	5,567
Letters sent	1,667	3,756	4,646	5,313
References to other Departments	482	1,790	1,885	2,318
Reports from other Departments	256	1,395	1,275	1,257
Circulars sent	240	954	500	300
Warrants for removal and discharge of Lunatics	34	359	310	353
Statutory returns received, entered and fyled or transferred to other Departments	52	2,500	3,200	3,200
Notarial Certificates prepared and issued	48	76	115	91
Letters Patent issued to Joint Stock Companies	19	119	114	92
Supplementary Letters Patent issued to Joint Stock Companies			10	10
Marriage Licenses, Certificates and Affidavits issued			29,920	27,816
Printed forms *re* lunatics distributed to Sheriffs			1,800	1,700
Other printed forms distributed for Municipal, Joint Stock Companies and other returns			3,500	3,600
Commissions under Great and Privy Seals	135	275	318	309
Total fees received by Secretary's Office	$1,938	$7,021	$8,199	$7,299
Ontario Gazette—				
Proclamations published		17	4	31
Appointments Gazetted	110	525	461	481
Public Notices	13	119	123	107
(*a*) Of incorporation of Joint Stock Companies.				
(*b*) Of increase of stock of Joint Stock Companies; and				
(*c*) Other public notices.				

DETAILED STATEMENT of the Joint Stock Companies incorporated by Letters Patent under the R. S. O., cap. 150, during the year 1884.

NAME.	Stock of Company.	Number of Shares.	Amount of Each Share.
The Ontario Brewing and Malting Company	$250,000	2,500	$100
The Hamilton Cricket Club	15,000	1,500	10
The Kingston Ladies Medical College	10,000	2,000	5
The Peterborough Street Railway and Transfer Company	100,000	1,000	100
The St. Malo Vineyard Association of Ontario (Limited)	60,000	600	100
The Producers Tanking Company of Petrolia	50,000	500	100
The Toronto Knitting Machine Company (Limited)	50,000	1,000	50
The Sarnia Curling and Skating Rink Club (Limited)	3,000	150	20
The Imperial Mineral Water Company of Ontario	10,000	100	100
The West Oxford Cheese and Butter Manufacturing Company	5,000	250	20
The London Stock Company of Ontario	100,000	1,000	100
The Kingston Oil and Enamelled Cloth Company	12,000	120	100
The Arthur Mining Company of Ontario	750,000	7,500	100
The Pelee Club	25,000	25	1,000
The Central Canada Loan and Savings Company of Ontario	2,000,000	20,000	100
The Toronto Woollen Manufacturing Company	300,000	3,000	100
The Whirlpool Rapids and Park Company (Limited)	25,000	1,000	25
The Waterford Manufacturing Company (Limited)	100,000	1,000	100
The Ontario Tanners' Supply Company	60,000	600	100
The Huntsville Dairy Company (Limited)	3,000	300	10
The Armow Creamery Cheese and Butter Factory of Kincardine, Ontario	2,000	80	25
The Vienna Joint Stock Cheese Company (Limited)	900	90	10
The Otter Creek Cheese and Butter Manufacturing Company	3,000	150	20
The Telephone Manufacturing Company of Toronto	2,500	100	25
The Parkdale Lumber Manufacturing and Building Company	45,000	90	500
The Western Ontario Telephone and Telegraph Construction Company	50,000	500	100
The Western Ontario Electric Lighting and Power Company	50,000	500	100
The Courtright Salt Company (Limited)	20,000	200	100
The Erie Iron Works Manufacturing Company of St. Thomas	50,000	500	100
The Peterborough Electric Light Company	100,000	1,000	100
The Parry Sound River Improvement Company	50,000	2,500	20
The Laidlaw Manufacturing Company of Hamilton	30,000	300	100
The Dufferin Horse Breeding Association	45,000	225	200
The Paris Cricket Club	4,000	400	10
The Deemerton Butter and Cheese Company (Limited)	800	160	5
The Windsor Fair Ground and Driving Park Association	6,000	60	100
The Conger Lumber Company	200,000	4,000	50
The Garrick Club of Hamilton, Ontario	3,000	300	10
The San Augustin Mining Company of Toronto (Limited)	1,250,000	12,500	100
The Ottawa Temperance Coffee House Company (Limited)	5,000	1,000	5
The Emerson Natural Gas, Light and Fuel Company of Hamilton (Limited)	75,000	750	100
The Orford Cheese Manufacturing Company (Limited)	2,000	200	10
The Picton Rink Company	3,000	120	25

The Lansdowne Skating and Curling Rink Company of the City of Hamilton	10,000	1,000	10
The Leander Boat House Company of Hamilton	2,000	200	10
The St. Thomas Biscuit and Confectionery Company (Limited)	25,000	1,000	25
The Springbrook Elevator Company	3,000	300	10
The Pembroke Skating and Curling Rink Company	2,000	80	25
The Brandon Manufacturing Company of Toronto (Limited)	50,000	500	100
The English Grazing and Lumber Company of Ontario	50,000	1,000	50
The Empire Cement and Lime Company of Ontario (Limited)	20,000	200	100
The Smith and McGlashan Company of Toronto (Limited)	20,000	400	50
The John Stuart Son and Company (Limited) Hamilton	150,000	1,500	100
The Welland Printing and Publishing House Company	10,000	200	50
The Fort Erie Canning Company	3,000	30	100
The St. Catharines Curling and Skating Rink Company (Limited)	15,000	300	50
The St. Thomas Park Company	40,000	400	10
The Wilson Cheese Company of Metcalfe	2,000	200	10
The Empress Sewing Machine Company of Toronto	100,000	1,000	100
The Metropolitan Street Railway Company of Ottawa	100,000	1,000	100
The Gravenhurst Park Association	2,000	200	10
The Clay Paving Stone and Brick Manufacturing Company of Toronto (Limited)	100,000	5,000	20
The D. F. Jones Manufacturing Company of Gananoque (Limited)	200,000	2,000	100
The *Budget* Printing and Publishing Company of Toronto	8,000	80	100
The Strathroy Grain Elevator Company (Limited)	3,000	120	25
The Ontario Comb Company	3,000	60	50
The Germania Club of Hamilton, Ontario	2,000	200	10
The Port Arthur Boom and Slide Lumbering Dock and Forwarding Company (Limited)	50,000	2,500	20
The Almonte Driving Park Association (Limited)	3,000	60	50
The Port Arthur (Ontario) Telephone Company	15,000	600	25
The D. W. Beadle Nursery Company of St. Catharines (Limited)	100,000	1,000	100
The St. Catharines Electric Light and Power Company (Limited)	50,000	5,000	10
The South Simcoe Warehousing Company	3,000	120	25
The Rabbit Mountain Mining Company of Ontario	2,000,000	200,000	10
The Ontario Silver Company (Limited)	50 000	500	100
The Thorold Felt Goods Company (Limited)	10,000	100	100
The Gananoque Spring and Axle Company	150,000	1,500	100
The Metropolitan Athletic Grounds Company of Ottawa (Limited)	7,000	700	10
The Oshawa Milling Company	20,000	200	100
The Ontario Sewing Machine Company	3,000	30	100
The Port Arthur Street Railway Company	60,000	600	100
The Hanover Store House Company	2,000	200	10
The Bobcaygeon Curling and Skating Club (Limited)	1,500	300	5
The Ottawa Electric Light Company	150,000	1,500	10
The Orvis Hydro-Carbon Furnace Company of Toronto (Limited)	100,000	1,000	100
The Hamilton Turkish and Swimming Bath Company (Limited)	5,000	250	20
The Listowel Rink and Park Company	4,000	400	10
The Hamilton Horse and Cattle Food Company	3,000	120	25
The Osborne-Killey Manufacturing Company of Hamilton (Limited)	100,000	1,000	100
The Cleveland Mining Company of Ontario	750,000	7,500	100
The Pembroke Printing and Publishing Company (Limited)	10,000	1,000	10
The Napanee Paper Company	50,000	50	1,000
Total	$10,541,700		

DETAILED STATEMENT of Supplementary Letters Patent issued to Joint Stock Companies during the year 1884.

INCREASING CAPITAL STOCK.	From	To	Increase.
The Lincoln Paper Mills Company	75,000	125,000	50,000
The *Grip* Printing and Publishing Company	50,000	100,000	50,000
The South Boundary Blanchard Cheese and Butter Factory	1,500	3,000	1,500
The J. H. Stone Manufacturing Company, of Hamilton	50,000	100,000	50,000
The Copland Brewing Company, of Toronto	60,000	100,000	40,000
The Peel Cheese and Butter Manufacturing Company	2,500	4,000	1,500
The Merritton Cotton Mills Company (Limited)	200,000	300,000	100,000
The Dereham and West Oxford Independent Butter and Cheese Manufacturing Company (Limited)	3,000	5,000	2,000
The North Osnabruck Cheese Manufacturing Company	900	1,200	300
Increase in Capital Stock of Companies previously incorporated			$295,300
Capital of Joint Stock Companies incorporated during 1884			10,541,700
Total Capital represented			$10,837,000

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CHANGING NAME FROM	To
The South Boundary Blanchard Cheese and Butter Factory.	Blanchard and Nissouri Cheese and Butter Company.

DETAILED STATEMENT of Orders in Council changing the names of Companies under the provisions of R. S. O. cap. 172.

FROM.	To.
The Essery Manufacturing Company.	The Toronto Planing Mills Company, of Ontario.
The Leadlay and Barber Knitting Company, of Toronto.	The Standard Woollen Mills Company, of Toronto.
The Toronto Magdalen Asylum and Industrial House of Refuge.	The Toronto Industrial Refuge and Aged Women's Home.

THE FOLLOWING TABLE is a detailed Statement of Fees received and the Services rendered therefor.

		Number.	January.	Number.	February.	Number.	March.	Number.	April.	Number.	May.	Number.	June.	Number.	July.	Number.	August.	Number.	September.	Number.	October.	Number.	November.	Number.	December.	Total Number.	Total Am't.
			$		$		$		$ c.		$ c.		$		$		$		$		$ c.		$ c.		$ c.		$ c.
Commissions—Coroners	at $13 00	1	13	..	....	..	....	1	13 00	2	26 00	1	13	..	....	..	....	..	....	..	....	..	....	..	....	5	65 00
do Notaries Public	at 8 00	..	....	5	40	6	48	5	40 00	8	64 00	7	56	2	16	3	24	3	24	5	40 00	6	48 00	8	64 00	58	464 00
Other Commissions under Great Seal	at 13 00	7	91	4	52	5	65	6	78 00	2	26 00	1	13	4	52	3	39	1	13	5	65 00	1	13 00	4	52 00	43	559 00
Other Commissions under Privy Seal	at 8 00	9	72	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	9	72 00
Ferry Licenses	at 15 00	..	....	..	....	..	....	..	....	..	....	1	15	..	....	..	....	..	....	..	....	..	....	..	....	1	15 00
Superior Court Certificates	at 4 00	1	4	..	....	..	....	1	4 00	1	4 00	1	4	..	....	..	....	..	....	2	8 00	..	....	1	4 00	7	28 00
County Court do	at 2 50	..	....	..	....	..	....	1	2 50	..	....	..	....	..	....	..	....	..	....	..	....	..	....	1	2 50	2	5 00
Surrogate Court do	at 2 00	..	....	4	8	..	....	..	....	4	8 00	..	....	..	....	..	....	2	4	1	2 00	..	....	..	....	11	22 00
Judicial Notarial Certificates	at 1 00	16	16	6	6	10	10	15	15 00	5	5 00	5	5	4	4	3	3	6	6	9	9 00	7	7 00	5	5 00	91	91 00
Companies' By-laws, Increase of Capital Stock, etc	at 5 00	..	....	..	....	..	....	..	....	..	....	..	....	1	5	..	....	..	....	..	....	..	....	1	5 00	2	10 00
Licenses to Incorporated Companies	at 20 00	..	....	..	....	..	....	..	....	..	....	..	....	1	20	..	....	..	....	..	....	..	....	..	....	1	20 00
Change of name, etc	at 25 00	..	....	..	....	..	....	..	....	1	25 00	..	....	1	25	..	....	..	....	..	....	1	25 00	..	....	3	75 00
Charters of Incorporation	at 10 00	1	10	..	....	7	70	2	20 00	5	50 00	2	20	1	10	3	30	3	30	3	30 00	1	10 00	2	20 00	30	300 00
do do	at 30 00	1	30	4	120	..	....	8	240 00	4	120 00	3	90	2	60	1	30	1	30	..	....	6	180 00	2	60 00	32	960 00
do do	at 40 00	2	80	3	120	..	....	3	120 00	3	120 00	3	120	..	....	..	....	..	....	2	80 00	1	40 00	1	40 00	18	720 00
do do	at 50 00	..	....	..	....	2	100	..	....	..	....	1	50	2	100	2	100	..	....	1	50 00	1	50 00	3	150 00	12	600 00
do do	at 60 00	..	....	2	120	1	60	1	60 00	1	60 00	..	....	..	....	1	60	..	....	..	....	2	120 00	..	....	8	480 00
do do	at 75 00	1	75	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	1	75 00
Marriage Licenses, Certificates and Affidavits		..	205	..	200	..	276	..	205 00	..	200 60	..	186	..	192	..	135	..	240	..	317 50	..	235 20	..	346 00	.....	2738 30
		39	596	28	666	31	629	43	797 50	36	708 60	25	572	18	484	16	421	16	347	28	601 50	26	728 20	28	748 50	.....	7299 30

Appendix I hereto is the Report of the Deputy Registrar with respect to the transactions for the year in the Registrar's branch.

Appendix II is a statement of the Returns prepared in obedience to Orders of the House, and presented during the session of 1884.

In addition to this Report, the following Reports from this Department have this Session been laid on the table of the House :—

Seventeenth Annual Report of the Inspector of Prisons and Public Charities on the Asylums for the Insane and the Asylum for Idiots of Ontario, for the year ending 30th September, 1883.

Seventeenth Annual Report of the Inspector of Prisons and Public Charities upon the Common Gaols, Prisons and Reformatories of Ontario, for the year ending 30th September, 1884.

Fourteenth Annual Report of the Inspector of Prisons and Public Charities upon the Ontario Institution for the Education and Instruction of the Deaf and Dumb, Belleville, for the year ending 30th September, 1884.

Thirteenth Annual Report of the Inspector of Prisons and Public Charities upon the Ontario Institution for the Education and Instruction of the Blind, Brantford, for the year ending 30th September, 1884.

Fifteenth Annual Report of the Inspector of Prisons and Public Charities upon the Hospitals of Ontario for the year ending 30th September, 1884.

Fifteenth Annual Report of the Inspector of Prisons and Public Charities upon the Houses of Refuge and Orphan and Magdalene Asylums, aided by the Province of Ontario, for the year ending 30th September, 1884.

Report of the Registrar General for 1883.

Report of the Provincial Secretary upon the working of the Tavern and Shop Licenses Act for 1884.

Report of the Inspector of Division Courts for 1883.

Report of the Inspector of Division Courts for 1884.

Report of the Department of Immigration for 1884.

All of which is respectfully submitted.

ARTHUR S. HARDY,

Secretary and Registrar.

Provincial Secretary's Office,
Toronto, 25th March, 1885.

APPENDIX I.

PROVINCIAL REGISTRAR'S OFFICE, ONTARIO,
TORONTO, 21st March, 1885.

SIR,—In compliance with your request, I have the honour to submit for your information a statement of the work done in the Registrar's Branch of the Provincial Secretary's Department from the 1st January, 1884, to 31st December, 1884.

I have the honour to be, Sir,
Your obedient servant,

JOHN F. C. USSHER,
Deputy Registrar.

The HON. A. S. HARDY,
Provincial Secretary.

A CONDENSED STATEMENT shewing the work done in the Registrar's Branch of the Department of the Provincial Secretary from the 1st January, 1884, to 31st December, 1884:

DOCUMENTS.	Recorded.	Indexed.
Commissions, Great Seal	97	97
Commissions, Privy Seal	93	93
Special Commissions	10	10
Letters Patent, Joint Stock Companies	89	89
Supplementary Letters Patent	17	17
Bonds and Covenants	43	43
Provincial Land Surveyors' Certificates	8	8
Warrants removing Lunatics	272	272
Warrants discharging Lunatics	81	81
License Commissioners' Commissions	105	105
Inspectors' Commissions	4	4
Election writs	5	5
Ferry licenses	2	2
LAND PATENTS.		
Crown Land sales	604	604
Free Grants	520	520
Cancelled Patents	12	12
Mining Patents	145	145
Patent to C. P. R'y. (60 folios MS.)		
Special deeds	11	11

In addition to the foregoing, an Annual Return of all Bonds and Securities recorded in this Department under 31 Vic. cap. 37, is prepared for the Legislative Assembly, and a quarterly Return of all the lands is also sent to the Registrar of each County in which Patents have issued. Two hundred and sixty-two letters were sent and twenty-five copies of Patents issued.

JOHN F. C. USSHER,
Deputy Registrar.

PROVINCIAL REGISTRAR'S OFFICE,
21st March, 1885.

APPENDIX II.

Synopsis of Returns to Addresses and Orders of the House presented to the Legislative Assembly during the Session of 1884.

No.	Sessional Papers.	Subject.	Mover.
1	No. 17	Correspondence and Orders in Council relating to the Union Fire Insurance Company of Toronto since 1880	Mr. Lauder.
2	" 18	The number of Local Boards of Health organized in 1882; the number reported to the Provincial Board of Health; the existence and nature of contagious diseases, etc	Mr. Brereton.
3	" 20	The number of appeals to the County Judge of the County of Kent, from the Court of Revision of each of the Municipalities of the said County, in reference to assessments upon the lands for drainage, etc	Mr. Robinson (Kent).
4	" 21	The number of Lunatics committed to the Gaols in each County during the years 1880, 1881 and 1882; the length of time they remained in Gaol, and how disposed of	Mr. Robertson.
5	" 22	The number of members of each County Council in the Province; the number of such members representing Towns, Villages or Townships, and the assessments of each such Town, Village or Township	Mr. Hay.
6	" 23	The number of Reeves and Deputy Reeves composing the various County Councils of the Province, in the years 1872, 1877 and 1881 respectively, with a statement of the amount paid as indemnity to members in each of the above named years	Mr. Drury.
7	" 24	The number of Petitions that have been received by the Government during the years 1880, 1881 and 1882 from Municipal Councils, asking that the power of granting licenses may again be placed in their hands, and also for a relaxation of the Saturday night restrictions	Mr. Waters.
8	" 25	Correspondence respecting the granting of a hotel license to one Conover, in the Village of Blue Vale	Mr. Gibson (Huron).
9	" 35	The number of Teachers in each High School and Collegiate Institute in the Province in the years 1881, 1882 and 1883; the salary paid to each Teacher, and the Government grant to each School and Institute	Mr. Brereton.
10	" 39	All Acts passed by the Legislature of Ontario and disallowed by the Government of the Dominion since July, 1867, with reasons for disallowance	Mr. Morris.
11	" 43	Correspondence between the Goverment of Ontario and the Governments of Canada, or of Quebec, or any members thereof, respectively, relative to a settlement of the outstanding accounts between the said Governments, or of the Land Improvement Fund	Mr. Creighton.
12	" 44	Municipalities in which Public Markets were in existence at the passing of the Act respecting Market Fees, those which have abolished Market Fees, and those which impose fees under section 8 of the Act	Mr. French.
13	" 45	Municipalities that since January, 1876, have passed by-laws limiting the number of Tavern Licenses; those that have passed by-laws restricting the number of Shop Licenses, and those that have passed by-laws restricting Shop License holders, so as to confine the business of such shops solely and exclusively to the keeping and selling of liquor, or which have imposed restrictions other than that imposed by statute on such	Mr. Ferris.

14	No.	46	The amount expended by the several municipalities in the years 1871, 1872, 1880, 1881 and 1882, designating as far as possible, the different services for which such expenditure was made, and also the amounts received by the municipalities in the same years, and for the years 1874 and 1875, from liquor licenses, and also from fines for breach of license laws or liquor license by-laws for the same years	Mr. Ferris.
15	"	48	Correspondence between the surgeon of the Central Prison and any member or officer of the Government in reference to meat supplied to that institution	Mr. Gray.
16	"	49	Copies of the writ of election for the holding of the last election in the District of Algoma; instructions to Returning Officers; correspondence, etc	Mr. Creighton.
17	"	51	Annual Reports of the Muskoka Slide, Dam and Boom Company for the years 1882 and 1883	Mr. Carnegie.
18	"	53	What timber cut in disputed territory outside the railway belt has been seized by the Government; names of firms in whose possession it was. 2. Receipts since 1st June, 1883, for dues on timber cut in disputed territory. 3. Instructions given to Aubrey White, etc	Mr. Meredith.
19	"	54	All sums claimed by, or allowed to, Returning Officers or other persons for services or expenses in connection with the last election in the District of Algoma	Mr. Creighton.
20	"	56	Copies of the commission issued to Messieurs Patullo and Burden in connection with the disputed territory, etc	Mr. Meredith.
21	"	57	Correspondence relating to the project of establishing an international Park at the Falls	Mr. Harcourt.
22	"	59	Total amount expended for repairs and for rents and repairs of temporary offices in Parliament Buildings since 1st January, 1880	Mr. Clarke (Toronto).
23	"	60	Correspondence respecting the appointment of Stipendiary Magistrate and Division Court Judge for the provisional County of Haliburton, etc	Mr. Carnegie.
24	"	63	Correspondence respecting the appointments of Police Magistrates in the Villages of Merrickville and Cardinal, and the Town of Prescott	Mr. French.
25	"	64	Correspondence between the Government and the representatives of the municipalities bordering on Lakes Simcoe and Couchiching, on the subject of removing the obstructions from the Severn river	Mr. Widdifield.
26	"	69	The population of the Village of Gravenhurst according to the last Dominion census; also the number of tavern licenses granted in the said village during the years 1881, 1882, 1883 and 1884	Mr. Meredith.
27	"	70	Correspondence in connection with the refusal to grant a license to Mr. Bradley of the Lambert Hotel, Port Hope	Mr. Brereton.
28	"	71	Specifications, estimates and tenders for Gaol at Rat Portage; statements shewing what part, if any, was done under contract, expenditure incurred, and amount unpaid if any, on account of constructing said gaol	Mr. Monk.
29	"	72	Correspondence relating to the Boundary between the Provinces of Ontario and Quebec, north of Lake Temiscamingue, etc	Mr. Morris.
30	"	73	Statement shewing the receipts and expenditures of the Province between January 1st and February 15th, 1884	Mr. Carnegie.
31	"	75	Statement shewing in detail all moneys expended in or in connection with the disputed territory or its government, since 1st June, 1883; the persons to whom such moneys were paid, etc	Mr. Meredith.

SYNOPSIS of Returns, etc.—*Continued.*

No.	SESSIONAL PAPERS.	SUBJECT.	MOVER.
32	No. 77	Judgments of the Judicial Committee of the Privy Council in the cases of Russell *vs.* the Queen, and Hodge *vs.* the Queen	Mr. Badgerow.
33	" 78	Amount paid to each railway out of the funds of the Province up to December, 1883, and total amount of unpaid certificates	Mr. Waters.
34	" 80	The assessed value of property in each School Section in 1883; amount raised for ordinary school purposes, with the rate on the dollar, for the same year; the amount received by each section from the Government; the length of time in said year the schools in each section were kept open	Mr. Wood.
35	" 81	Correspondence between the Government of Ontario and the Government of the Dominion respecting claims due to the Indians on Lakes Huron and Superior under the "Robinson Treaty."	Mr. Creighton.
36	" 82	Correspondence with regard to the conduct of one J. P. Foley, Esquire, of Mara, one of the Justices of the Peace for the County of Ontario	Mr. Meredith.
37	" 84	Orders in Council with regard to powers of Public School Inspectors as to changes in text-books, etc	Mr. Creighton.
38	" 85	The value on the first day of January, 1884, of the then outstanding scrip in aid of Railways	Mr. Carnegie.
39	" 86	Statement of forty year scrip necessary to take up Railway Scrip outstanding	Mr. Carnegie.
40	" 87	Corrrespondence, lease and papers connected with the leasing of a part of Rondeau Point to Messieurs Weldon	Mr. White.
41	" 88	Correspondence with reference to the removal of John Nott, Esq., from the office of Police Magistrate of Port Perry	Mr. Meredith.
42	" 89	Copies of all General Rules and Orders made by the Court since the passing of the Ontario Judicature Act	Mr. Baskerville.
43	" 90	Correspondence between the Lambton Prohibitory Association and Provincial Secretary with regard to a License Office at Petrolia	Mr. Roe.
44	" 91	Circular issued from the Department of the Attorney-General with respect to the efficiency of the present system of detecting crime	Mr. Balfour.
45	" 92	The names and residences of the members now composing the Central Committee of Examiners, dates of their appointments, Orders-in-Council, or Departmental Regulations, defining the powers and duties of the Committee.	Mr. Metcalfe.
46	" 93	Orders-in-Council with regard to the use of text-books in the Normal and Model Schools since 1867	Mr. Broder.
47	" 95	The dates at which the Reports of the Inspector of Insurance Companies have been laid upon the table of the House, and a corresponding statement regarding similar reports made to Dominion Parliament	Mr. Morris.

48	No.	96	Petitions from Municipal Corporations praying for the investigation of the Financial standing of said corporations, and all correspondence between the Government and said corporations in regard thereto	Mr. Graham.
49	"	97	Communications between the Senate of the University of Toronto and the Government on the subject of further State aid to the University	Mr. Gibson (Hamilton).
50	"	99	Names of officers and directors of the Muskoka Slide, Dam and Boom Company, copy of charter, tariff, etc	Mr. Meredith.
51	"	100	Amount of money in each year, from 1871 inclusive, paid by the teachers of Ontario into Superannuated Teachers' Fund, and the several amounts paid out by the Government on account of same	Mr. McLaughlin.
52	"	101	Names of persons to whom the prices for which, and the dates when, the water fronts at Prince Arthur's Landing were sold	Mr. Meredith.
53	"	102	Municipalities which have borrowed from the Province under the provisions of the Tile Drainage and Municipal Drainage Acts, date of loans, amounts borrowed and amounts paid on account thereof	Mr. Clancy.
54	"	103	The amount of money on deposit in banks to the credit of the Province on the first days of January, February and March, 1884	Mr. Kerr.
55	"	104	Respective amounts paid by municipalities in which the Dunkin or other Temperance Acts are in force towards the License Fund of the districts in which they are situated	Mr. Preston.
56	"	105	Shewing the several lots in the Townships of Tudor, Wollaston, Limerick and Faraday, which have been sold or otherwise disposed of since January 1st, 1880	Mr. Wood.
57	"	107	Instructions given to, and reports and correspondence from, the "Consulting Board" with reference to the erection of three public creameries, and a statement of all money paid to or still due any member of such Board, or other person, for his services in connection therewith	Mr. Creighton.
58	"	108	Names of all prisoners who, during the year 1883, were punished for infraction of rules at the Central Prison	Mr. Gray.
59	"	109	Shewing what lands in the District of Algoma, including the Disputed Territory, have been sold or disposed of since January 1st, 1882, with names of persons to whom sold	Mr. Meredith.
60	"	110	Orders in Council passed under the General Mining Act creating, extending, adding to or diminishing mining divisions	Mr. Meredith.
61	"	111	Statement shewing in detail all claims brought before the Commissioners appointed in the Disputed Territory, and statement of expenditure in connection with the commission	Mr. Meredith.

(No. 78.)

Return of all market fees and market rents, salaries of market clerks, with rates of fees now charged and any changes of fees known to the Department since the passing of the Act relating to Market Fees, being 45 Vic., cap. 24. (*Not printed.*)

(No. 79.)

Return of all correspondence between the Crown Lands Department, or any officer thereof, or any other person, with reference to the opening up for settlement of the Townships of Himsworth and North Nipissing, or any part of them, and also of all petitions, reports or Orders in Council on the subject; also for copies of all petitions or applications to the Crown Lands Department for a supply of timber for the purposes of a local mill there, and of all correspondence between the Department and any other person on the subject. (*Not printed.*)

(No. 80.)

Statement of the Assets, Liabilities, Revenue, Expenditure, etc., of the several Municipalities in the Province, as made by the Clerks of the Municipalities for the year 1883. (*Not printed.*)

(No. 81.)

Return of copies of all reports made to the Government by Directors of Joint Stock Road Companies for the year 1884, under sec. 146, cap. 152, of the Revised Statutes, as amended by ss. 6 and 7, cap. 25, 47 Vic., and a Return shewing the date of construction of all toll roads in the Province, the number of toll-gates maintained thereon, the rate *per* mile charged as tolls, and specifying the amount of the original capital stock, and the amount of the present stock, with the reasons for an increase, if any, in each case; also a Return shewing the toll roads which have been abolished in the Province, or on which the collection of tolls has ceased, and the manner and terms of their abolition, or the reasons why tolls have ceased to be collected. (*Not printed.*)

STATEMENT

In detail of Receipts and Expenditures on account of the Mercer Estate for the year 1884. Presented to the Legislative Assembly

By Command.

ARTHUR S. HARDY,

Secretary.

Provincial Secretary's Office.

Toronto, 27th March, 1885.

Accounts in detail of all moneys received and expended on account of the Mercer Estate from 1st January, 1884, to 31st December, 1884.

Date.		Receipts.	$ c.
1884.			
January	12	On account Benson mortgage	10 00
February	4	" " " "	10 00
"	12	Clarkson Jones, on account purchase money on lots 7 and 8, Wellington St., Toronto	3,000 00
"	29	On account Benson mortgage	10 00
March	8	Rent from Wm. Dalton, Etobicoke farm	220 00
"	8	F. Wyld, on account purchase money on lot 1, Bay St., Toronto	1,800 00
"	8	" " " 2, "	924 50
"	8	D. Graham, on account purchase money on lot 5, in 8th con. N. Gwillimbury	100 00
"	8	J. H. Taylor, on account purchase money on lot 27, 3rd con. Etobicoke	2,000 00
"	21	F. Wyld, on account purchase money on lots 1 and 2, Bay St., Toronto	10,898 00
"	31	On account Benson mortgage	10 00
April	3	" Keogh "	500 00
"	16	" Unwin "	2,400 00
"	30	" Benson "	10 00
May	23	J. H. Taylor, on account purchase money on lot 27, 3rd con. Etobicoke	500 00
"	28	On account Benson mortgage	10 00
June	5	Rent from Wm. Dalton, Etobicoke farm	220 00
July	18	J. H. Taylor, interest on mortgage	115 00
"	30	On account Benson mortgage	10 00
August	29	" " "	10 00
October	1	" " "	10 00
"	11	Anne Gordon, purchase money for lot 3, on Bay St. Toronto	6,220 37
"	11	Mrs. C. McDonald, purchase money for lots 4 and 5, on Bay St., Toronto	12,440 74
"	28	On account Benson mortgage	10 00
November	28	" " "	10 00
"	29	Wm. Dalton, on account purchase money on lot 27, 4th con. Etobicoke	900 00
"	29	Jos. Reynolds, rent of Tecumseth lots (nominal)	2 00
"	29	Robert Veitch, 6 mos. rent of Berkeley St. house	36 00
December	4	A. A. Allan, on account purchase money on lot 6, Bay St., Toronto	570 00
"	29	On account Benson mortgage	10 00
"	29	Mr. and Mrs. Mercer, per General Trust Co., advance made to them to pay rent	35 00
			$43,001 61

		Expenditures.	
January	3	A. F. Mercer, for support of his family	25 00
"	4	A. F. Mercer's account, furniture bought under execution by Trustee.	74 60
"	11	A. F. Mercer, for support of family	125 00
"	21	A. F. Mercer's account, per P. Small, Bailiff, judgment and costs Tyrrell *vs.* Mercer	19 27
"	31	A. F. Mercer's account, wages of servant	38 85
February	5	A. F. Mercer, for support of family	125 00
March	1	" " "	62 50
"	1	Mrs. Mercer, " "	62 50
"	13	A. F. Mercer, for expenses of moving	21 50
"	13	" for to redeem goods	25 00
"	13	A. F. Mercer's account, per P. Small, Bailiff, judgment in Carrick *vs.* Mercer	16 79
"	20	A. F. Mercer, to pay wages of servant	25 00
"	20	A. F. Mercer's account, per P. Small, Bailiff, judgment Tyrrell *vs.* Mercer	22 96
"	31	A. F. Mercer, for support of family	62 50
"	31	Mrs. Mercer, " "	62 50

ACCOUNTS in detail of all moneys received and expended on account of the Mercer Estate from the 1st of January, 1884, to 31st December, 1884.—*Concluded.*

DATE.	EXPENDITURES.	$ c.
1884.		
April 18	A. F. Mercer, to redeem goods	96 00
" 25	" " "	12 90
May 1	" for support of family	62 50
" 1	Mrs. M. A. Mercer, for support of family	62 50
" 1	A. F. Mercer's account, per W. R. Montgomery, rent	90 00
" 19	" " " P. Small, judgment and costs Hayward *vs.* Mercer	175 76
" 23	A. F. Mercer's account, furniture	33 25
" 29	James Smyth, reward for protecting deeds, etc	500 00
" 30	A. F. Mercer, for support of family	55 00
" 30	Mrs. Mercer, " "	55 00
July 1	A. F. Mercer, " "	45 00
" 1	Mrs. Mercer, " "	55 00
" 8	" " "	45 00
" 9	Wm. Hill, claim against A. F. Mercer	150 00
" 9	Chas. McDonald, " "	400 00
" 8	A. F. Mercer's account, wages of servants	50 00
August 5	Mrs. M. A. Mercer, for support of family	55 00
" 14	R. S. Williams, claim against A. F. Mercer.	2 63
" 14	B. & M. Saunders, " "	66 76
" 14	Bain, McDougall, Gordon and Shepley, " "	1 55
" 14	Glover Harrison, " "	15 21
" 14	House of Providence, " "	168 73
" 14	W. H. Park, " "	54 42
" 14	J. R. G. Montgomery, " "	12 52
" 14	W. H. Ferguson, " "	24 57
" 14	McLaughlin & Moore, " "	87
" 14	H. Graham & Co., " "	91 94
" 14	Jas. Munsford, " "	6 28
" 14	Terrence McCorry, " "	205 23
" 14	E. Lawson, " "	6 09
" 14	J. Singer, " "	15 45
" 14	A. White, " "	17 55
" 14	Dr. J. A. Temple, " "	6 95
" 14	T. Jifkins, " "	7 14
" 14	Dr. J. Thorburn, " "	3 40
" 14	Petley & Petley, " "	15 09
" 14	J. W. Cheesworth " "	70 62
" 14	E. Dack & Son, " "	2 16
" 14	Jas. Adams, " "	5 78
" 14	R. Hay & Co., " "	33 84
" 14	John B. Eagle, " "	7 07
" 14	Geo. Armstrong, " "	9 27
" 14	H. A. Collins, " "	51 22
" 14	J. Adams, M.D., " "	23 18
" 14	Jas. H. Rogers, " "	8 89
" 14	John Kay, " "	3 11
" 14	Alex. McNabb, " "	20 99
" 14	McDonald & Macgregor, " "	92 48
" 14	Jas. Grimon, " "	214 56
" 14	Mrs. M. McGregor, " "	64 57
" 14	Globe Printing Co., advertising for creditors	3 90
" 14	Willis Jones, for services in trying to arrange composition with creditors	10 00
November 1	Edgar & Malone, commission for services *in re* sales of land, corner Bay and Wellington streets	640 56
" 13	Edgar & Malone, commission for services *in re* sale of land, Etobicoke and Gwillimbury lots	188 75
" 26	Edgar & Malone, commission for services *in re* sale of land, corner of Bay and Wellington streets	503 75
" 22	Central Prison industries, bricks, etc., supplied Mercer Reformatory.	21,970 98
		$27,359 94

(No. 83.)

Tabulated Analysis of Reports of Electoral, District and Township Agricultural Societies and of Horticultural Societies for the year 1883 (*Not printed.*)

ANNUAL REPORT

OF THE

BUREAU OF INDUSTRIES

FOR THE

PROVINCE OF ONTARIO,

1884.

Printed by Order of the Legislative Assembly.

Toronto:
PRINTED BY GRIP PRINTING AND PUBLISHING CO., FRONT STREET.
1885.

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THIRD ANNUAL REPORT

OF THE

BUREAU OF INDUSTRIES.

To the Honorable Commissioner of Agriculture:

Sir,—I have the honor to present herewith the third annual report of the Bureau of Industries.

The weather tables, embracing temperature, precipitation and sunshine, have been compiled by Mr. Stewart, of the Meteorological Office. They are more complete for the Province than any that have been published hitherto.

The information and statistics relating to agriculture have been obtained from the same sources as in former years.

The returns of farmers' schedules, made under date of June 25, gave statistics of (1) areas of land occupied, cleared and under the various field crops, (2) numbers of live stock and quality of wool clip, (3) values of farm property, and (4) rates of rent and wages. These returns were compiled in the office, and are presented in tables VII. to XXII.

The clerks of township municipalities also made returns giving the areas of farm land—classed under the heads of cleared, in woods, and swamp, marsh or waste,—together with the areas of fall wheat and of orchard and garden, as collected by the township assessors.

The regular correspondents of the Bureau number about six hundred, and to these I am indebted for information on the progress of farm work during the season, the state of crops and live stock at different periods of the season, the product of crops, the supply of farm labour, etc. The returns of correspondents were made on the 15th of May, the

1st of August, and the 25th of October, and were used in preparing the special reports issued in May, August and November.

Statistics of the cheese industry have been furnished by factory men, and the number of factories for which returns have been received is considerably larger than in either of the previous years; still the record is not complete.

An effort has been made to collect statistics of the mining industries of the country, and various parts of the Province have been visited with that object. The results are not wholly satisfactory, but they encourage a continuance of the undertaking, especially in view of the promising development of our mineral wealth.

The statistics of labour have been gathered from two sources—(1) from the men, firms and companies that pay wages for service, and (2) from the wage receivers themselves. The returns of employers were collected almost wholly by Mr. John Leckie, Assistant Secretary of the Bureau; and those of the working classes by local agents who made a personal canvass in the towns and cities selected for the collection of statistics. This is the method pursued with success for a number of years by the Massachusetts Bureau, and I am under obligation to Carroll D. Wright, the late Chief of that Bureau and now Chief of the National Bureau at Washington, for much useful information on the practical working of a Labour Bureau.

The tables of population and local assessment have been compiled from the manuscripts of the official reports to Government departments made by the clerks of county and local municipalities, and by the inspectors of schools, with the exception of the municipal returns for 1877; these appear to have been destroyed or lost, and the printed copy in the sessional papers for that year has been used instead.

Faithful and valuable service in the statistical work of the Bureau has been rendered by W. O. Galloway and David I. Johnston, both of whom are now on the regular staff, and I deem it a duty to acknowledge my appreciation of their work.

I have the honor to be, Sir,

Your obedient servant,

A. BLUE,
Secretary.

Office of the Bureau of Industries,
Toronto, March, 1885.

PART I.

THE SEASON AND THE CROPS.

THE WEATHER.

The tables which record the state of the weather in 1884 are more complete than for the previous year, especially those which relate to rainfall and sunshine. Those relating to temperature have been collected at the same stations for a number of years, and for the portion of country south of Lake Nipissing and French River this service is as full as can be desired. But this embraces little more than half of the area of the Province, and in view of an early extension of settlements an effort should be made to collect data for complete weather charts of the whole region from Georgian Bay on the south to Hudson's Bay on the north, and from Lake Temiscamingue on the east to Lake of the Woods on the west. It is only by ascertaining the temperature, the precipitation and sunshine of the country that we can form a safe opinion on its suitableness as a field for colonization.

The following table gives the record of *mean* temperature at ten of the principal stations of the Province for the years 1883 and 1884, during the six months of the growing season :

Stations.	April.		May.		June.		July.		August.		September.	
	1884	1883	1884	1883	1884	1883	1884	1883	1884	1883	1884	1883
	°	°	°	°	°	°	°	°	°	°	°	°
Goderich.....	39.5	39.5	52.7	51.2	67.8	63.4	65.2	66.5	67.4	64.5	64.9	56.8
Windsor.....	44.1	44.6	58.5	52.9	70.4	64.2	70.0	67.6	69.9	68.0	68.3	60.1
Simcoe.....	41.2	41.8	55.1	51.5	67.8	64.2	66.1	67.0	66.6	65.1	65.1	56.2
Stratford	40.6	39.4	52.8	49.6	68.0	63.5	64.0	65.6	64.3	62.5	61.5	53.8
Hamilton.....	41.6	41.0	51.9	51.4	67.3	64.6	67.0	68.9	69.5	66.4	66.1	56.8
Toronto	40.9	38.3	51.2	49.3	65.1	62.1	64.3	65.7	65.6	63.7	62.2	55.0
Barrie	37.9	36.2	50.8	48.0	66.6	62.4	65.0	65.2	66.2	63.8	61.9	55.0
Peterboro'....	41.6	37.5	54.6	50.7	68.9	66.1	66.9	68.1	68.3	64.2	64.2	55.4
Cornwall	41.2	37.6	53.5	51.6	66.7	66.1	64.8	65.8	67.7	64.6	61.7	55.1
Pembroke.....	39.9	36.2	52.5	49.7	66.2	64.9	65.3	66.6	67.2	64.8	61.3	53.7

It will be observed that for the months of May and June, during which grain and grass crops make their chief growth, the average mean temperature was several degrees higher in 1884 than in 1883, while for the ripening month of July it was a little lower.

The higher temperature in the one case promoted a more active growth, and the lower temperature in the other favoured a more perfect maturity of the crops. The months of August and September also exhibit a higher general temperature in 1884 than in 1883; the effect of which was apparent in the bountiful yield of roots, corn and other late ripening field crops. A reference to the detailed table will show an abnormal drop of temperature in September, 1883, which destroyed corn, buckwheat and beans, and also oats and spring wheat in some northern localities. The same month in 1884 was remarkably free from frosts, and the average temperature was nearly 10° higher. But in the latter part of May the reports indicate frost for two or three days in succession, and the fruit crop suffered serious loss.

The record of rainfall for the same months gives the following averages for the four districts into which, for convenience, the Province has been divided :

Months.	West and S. W.		North and N. W.		Centre.		East and N. E.	
	1884	1883	1884	1883	1884	1883	1884	1883
	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.
April	1.24	1.60	1.01	1.36	0.77	1.65	0.68	1.52
May	3.11	4.96	3.72	3.78	2.53	4.82	2.40	4.87
June	2.19	4.96	1.40	5.67	2.12	4.86	1.16	4.44
July	3.55	5.71	2.41	4.02	3.61	3.78	4.21	3.39
August	1.94	1.55	1.42	1.98	1.62	2.38	2.42	2.19
September	2.05	2.70	3.45	3.32	2.81	2.33	2.35	2.81
Totals	14.08	21.48	13.41	20.13	13.46	19.82	13.22	19.22

The feature of this table is the exceedingly light rainfall in the north and north-west and east and north-east districts during the month of June, 1884, as compared with the corresponding month in the previous year. The figures indicate a visitation of drought in those districts, a striking effect of which was the failure of the hay crop.

The following table gives for the first time a comparison of the sunshine record at ten stations for two years :

Stations.	April.		May.		June.		July.		August.		September.		Totals.	
	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.	hours.
Windsor	167.7	192.6	196.0	198.2	256.6	211.0	247.1	279.0	250.1	297.0	198.7	157.4	1316.2	1335.2
Woodstock	157.2	160.5	170.7	172.7	265.8	207.7	248.4	227.2	264.0	274.4	211.5	177.4	1317.6	1219.9
Stratford	161.7	171.0	140.2	184.7	289.8	226.5	248.1	249.5	183.3	299.9	150.2	181.4	1173.3	1313.0
St. Catharines	114.4	154.3	147.3	191.1	283.6	219.4	257.5	241.5	279.4	262.5	.....	155.6	.....	1224.4
Toronto	166.0	184.7	209.3	184.0	320.4	241.5	246.9	275.1	281.1	305.1	214.2	193 1	1437.9	1383.5
Barrie	146.0	171.5	182.1	168.2	270.8	205.5	226.2	238.2	223.7	275.6	119.7	156.6	1168.5	1215.6
Lindsay	176.0	214.4	194.2	200.6	299.4	253.2	247.1	275.5	272.6	301.6	208.9	192.3	1398.2	1437.6
Kingston	140.6	184.3	173.8	218.8	239.5	244.7	191.1	263.4	290.2	267.5	228.8	190 6	1264.0	1369.3
Cornwall	146.1	244.7	178.3	210.1	299.7	230.9	184.6	274.1	259.1	247.2	188.7	202.0	1256.5	1409.0
Pembroke	137.3	.....	185.9	151.9	272.3	.....	166.6	265.8	248.4	240.0	145.8	143.8	1156.3	.....
Average for the Province.	151.3	167.7	177.8	188.0	279.8	226.7	226.4	258.9	255.2	277.1	185.2	175.0	1275.7	1293.4
Sun above horizon	406.4		461.1		465.7		470.9		434.5		376.3		2614.9	

There is not much difference to note in the comparison, except for the month of June, and last year's sunshine in that month exceeded the previous year's corresponding record by 53 hours. It is difficult to estimate the effect of such a difference, even if it be assumed that other conditions were equal, but there can be no doubt that it was important as well as beneficial. The total time of sunshine for the six months was scarcely one-half of the greatest possible time.

AREA OF FIELD CROPS.

The area of cleared farm land in the Province last year, as returned by township assessors, was 10,736,086 acres, while for the preceding year it was 10,539,557 acres. The following table presents for the last three years the number of acres under each of the principal field crops, and the ratio of each crop to the total area of cleared land :

Crops.	1884.		1883.		1882.	
	Acres.	Per cent	Acres.	Per cent	Acres.	Per cent
Fall wheat	864,740	8.05	1,097,210	10.41	1,188,520	11.68
Spring wheat	721,647	6.72	586,410	5.56	586,817	5.77
Barley	700,472	6.52	757,156	7.18	848,617	8.34
Oats	1,481,828	13.80	1,418,309	13.46	1,387,487	13.64
Rye	103,416	.96	188,111	1.78	185,276	1.82
Peas	570,928	5.32	542,771	5.15	560,770	5.51
Potatoes	168,757	1.57	166,823	1.58	160,700	1.58
Mangolds	18,341	.171	17,219	.164	15,791	.155
Carrots	10,987	.102	11,270	.107	9,955	.098
Turnips	104,199	.97	98,429	.93	78,823	.775
Corn	174,560	1.63	214,237	2.03	206,755	2.03
Buckwheat	65,836	.61	67,802	.64	50,035	.492
Beans	24,878	.232	25,907	.246	19,787	.194
Hay and clover	2,193,369	20.43	2,350,969	22.31	1,825,890	17.95
Totals	7,203,958	67.10	7,542,623	71.56	7,125,223	70.04

Returns of the area of pasture land were obtained for the first time last year, and they give a total of 2,794,986 acres. The balance of 737,142 acres is partly under orchard and garden, flax, hops, tobacco, etc., but by far the larger extent of it was doubtless fallow land. There was a decrease in the breadth under crops, as compared with 1883, of 338,665 acres—principally in such crops as hay and clover, barley, corn and rye. Wheat, oats, peas, beans, buckwheat and roots preserved the ratio of 1883 with little change.

FALL WHEAT.

The history of the fall wheat crop for the past year illustrates very forcibly the almost unlimited extent to which a favourable growing season will occasionally overcome the most adverse conditions as to seeding and early growth. In 1883 careful cultivation and early sowing proved of comparatively little avail against the effects of an unfavourable season, while in 1884 the sunshine and showers and moderate temperature largely overcame all defects of culture. Both these proportions are so exceptional, however, that they only deserve to be noted as proving the rule that proper cultivation and early sowing are in the great majority of cases the best guarantees of good crops, no matter what the character of the season may be. At seed time, owing to the fall drought, the ground was hard and lumpy, and the quality of the seed sown, even where farmers were able to procure old grain, proved so inferior that it frequently failed to germinate, and many fields had in consequence to be resown. The frosts and cold winds of September and October retarded growth in a marked degree, and excepting on warm soils, in a hearty condition, the plants were thin and weak when they went under their winter covering. Fortunately, however, over the greater portion of the Province the crop was fairly well protected

during the winter, and, with the limited exceptions noted in the subjoined detailed reports, the plants emerged in spring in a healthy though backward condition. The prospects in the middle districts of the Province, lying between London and Kingston, were on the whole favourable, but outside of these limits the reports made to the Bureau in May were rather gloomy. Cold winds and frosts in the latter part of March and early part of April did not improve the outlook, but fortunately this succession of evils was followed by an exceptionally favourable growing season, and the result was a rapid and satisfactory recovery even in localities where the prospect of an average crop seemed well nigh hopeless. The season was marked over the greater portion of the Province by moderately cool weather and occasional showers of rain, the effects of which were seen in continuous growth, healthy maturity and a fine sample of grain. Though the presence of the midge, weevil and other insect enemies is noted in some localities, their ravages were not sufficient to produce an appreciable effect on the aggregate crop. The harvest weather was also favourable on the whole, ahd the crop was usually secured in excellent condition. As generally happens after a poor harvest, the area under fall wheat, as will be seen by the following table, was very much less than in 1883, but so heavy was the harvest that the product was nearly double of the one for that year.

Districts.	1884.		1883.		Bushels per acre.	
	Acres.	Bush.	Acres.	Bush.	1884.	1883.
Lake Erie	215,213	4,557,227	241,539	2,378,956	21.2	9.8
Lake Huron	140,623	3,188,194	177,920	1,474,310	22.7	8.3
Georgian Bay	71,883	1,796,351	95,238	994,823	25.0	10.4
West Midland	247,288	6,212,444	310,058	3,086,777	25.1	10.0
Lake Ontario	153,991	4,254,945	203,948	2,571,306	27.6	12.6
St. Lawrence & Ottawa	13,592	251,264	31,534	552,909	18.0	17.5
East Midland	22,085	455,810	36,449	588,422	20.6	16.1
Northern Districts	65	1,396	524	9,454	21.5	18.0
Totals	864,740	20,717,631	1,097,210	11,656,957	24.0	10.6

LAKE ERIE COUNTIES.

Though the fall wheat in these counties made rather a poor start in the fall, it was well protected throughout the winter, except in the southern portions of Essex and Kent, and the result was that it made its appearance in the spring in a healthy condition, though somewhat thin on the ground. In the localities in which it was exposed during the winter it suffered so much from the intense cold of January and the strong winds from the lake, that large areas were ploughed up or resown with barley.

In the three easterly counties of the group spring frosts, coupled with the raw east winds, did considerable injury, especially on undrained clay lands, but in the other counties the outlook in the spring was more hopeful. But the unusually favourable growing season which followed overcame all drawbacks to an amazing extent, and almost equalized all variations of condition, for, even in those localities from which the most unfavourable reports were received in May, a rapid and satisfactory recovery took place.

Some apprehension was produced by a slight frost in the latter part of May, but except on low, undrained soils, the damage from this cause was scarcely appreciable, and on the whole the crops ripened in a fine, strong, healthy condition.

The injuries from atmospheric causes or insect pests were also but very small in the aggregate. There was as usual some rust in localities which, from their situation, were peculiarly liable to that disease. There were occasional reports of injury by hail storms as well as by weevil and Hessian fly, but the only serious complaint was of the damage done by the midge in the county of Elgin, especially to wheat of the Egyptian variety. But, as stated in the August report of the Bureau, "the harm done to the wheat crop by any agency has been infinitesimal," and a fine crop was reaped.

The weather in harvest was, generally speaking, favourable, and over the greater portion of this district farmers were able to prosecute their operations uninterruptedly

till the grain was saved, though some late fields suffered from the rains which fell in the latter part of July.

Not less satisfactory were the reports as to the quality of the grain. The heads were as a rule full, and the berry large, plump and well-coloured, though in a few instances there were complaints of its being shrunken.

Some of the undrained lands in the county of Kent suffered from the wet, but there were no complaints of damage by early frosts. As usual, the very best results were realized upon lands which were well tilled and drained.

LAKE HURON COUNTIES.

Dry weather prevailed generally at seeding time throughout the Lake Huron counties, and frost and cold winds succeeding in September and October the young plants were rather feebly equipped to encounter the vicissitudes of winter. A good covering of snow and fairly steady weather, however, enabled the wheat to hibernate successfully, and when the snow disappeared it presented a very encouraging appearance.

Considerable, and, in not a few instances, quite serious damage was done by dry frosts in the latter part of March and the early part of April. Light, dry soils were, as a rule, least subject to attacks of frost, though in a few instances low, rich, mucky soils, and, in others, well-drained clay lands, almost wholly escaped. The surest safeguards against spring frosts, however, proved, as usual, to be—putting the crops in early, and well and thorough underdraining in the case of land not naturally drained. Occasionally to the poor quality of the seed used was attributed the thin growth of the plant in the spring, much of the previous year's seed product having been shrunken with rust and foul with weeds. These combined influences compelled many farmers, in Huron especially, to plough up their fall wheat fields; but in Lambton and Bruce the acreage so dealt with was not nearly so large.

At the date of the May report of the Bureau the expectations of the farmers of this district did not rise higher than from one-half to two-thirds of a full crop. The succeeding summer, however, turned out to be an exceptionally fine growing season, and the wheat fields made a splendid recovery. The acreage sown in the fall had been considerably diminished by the quantity plowed up in the spring; but this, together with the decimation caused by frost, were more than counterbalanced by an almost complete immunity from insect pests and unfavourable atmospheric conditions, which were enjoyed throughout the whole district.

The worst effect of the spring cold, and that not a serious one, was unevenness in ripening. The weevil was complained of in but a few isolated localities, and its ravages were apparently insignificant. A correspondent in Dawn township, Lambton county, reported:

> The joint worm appeared to be working in the fall wheat, as much of it broke down, and rendered it necessary to mow it with scythes.

Rust, though present, was comparatively harmless, and as the grain advanced to maturity it developed everywhere large and well-filled ears.

Harvesting operations began early, and were favoured with most auspicious weather. In the more southerly townships of the group the reaping machines were at work as early as from the 15th to the 25th of July. The season having been so uniformly favourable, the grain was garnered in first-class condition, the reports being practically unanimous in pronouncing the sample one of unusual excellence—unsurpassed, indeed, in many previous years.

GEORGIAN BAY COUNTIES.

The reports as to the fall wheat crop in the Georgian Bay group of counties were not so uniformly favourable as in most of the other counties of the western peninsula. Compared with the previous year, a considerably diminished area was sown, and a large proportion of the total acreage was put in so late and so poorly that, notwithstanding the rather favourable conditions during the winter, the young plants had not acquired sufficient

vitality to withstand the cold, frosty winds of early spring, especially where sown on exposed knolls and uplands, on which the snow laid only for a short time. On the other hand, the crop sustained comparatively little damage on low, well-drained, clayey soils; indeed, wherever the land was well tilled and properly drained, and the seed sown in good season, the effects of the unfavourable spring weather were pretty well overcome.

The tone of the reports improved as the season advanced, and on the whole, as in the other parts of the Province, the crop appeared to have made a surprisingly good recovery, the yield proving much better than was predicted in May. Fortunately, too, even in those localities from which came the most gloomy reports, very little ploughing up was done, and many fields which in spring promised less than half a crop produced returns which were nearly or quite up to the average of former years.

The damage done by insects was limited. The operations of the wire worm were noticed in the northern part of St. Vincent township, Grey county; and in Normanby, in the same county, some fields were reported to have been eaten off at the roots and broken down a good deal, though the cause is not specifically mentioned. Another report, coming from a correspondent in Vespra, Simcoe county, stated that the fall wheat was a good deal broken down by weakness in the straw, though no insect was discoverable.

As usual, rust did some damage on low land, and the sample suffered from this cause as well as from winter-killing, although generally speaking it was of fairly good quality both as to weight and colour.

WEST MIDLAND COUNTIES.

The opening of spring found the fall wheat crop in the West Midland counties, on the whole, in a promising condition. Whatever injury was manifest appeared to be not general or in wide areas, but confined to patches, so that it was evidently due to local or incidental rather than to universal causes. These the reports concurred in tracing to late sowing, to consequently retarded growth, to dry, cold winds and frosty nights in April, and to the absence of careful cultivation, shelter, and especially drainage.

The wheat generally survived the winter in safety, but it had attained such little growth as to be peculiarly liable to frost, unless where guarded by effective drainage or shelter. Some low, flat, heavy, undrained lands lost about half their growth, and were ploughed up, while properly drained fields, whether light or heavy, especially if sown early, were full of promise. What was written by a Middlesex correspondent fairly described the general state of the crop throughout the district about the beginning of May:

> On light, loamy soil, well drained by nature or art, well sheltered and well tilled, and put in in season, very good; on flat soil, and heavy clay, with these conditions reversed, appearance poor, and in some cases very poor.

A Waterloo correspondent made a similar report:

> On light soil or drained land, where early sown, very good; on the same soil, ten days later sown, very inferior; on heavy or undrained land, very poor.

The farmers looked forward to the approach of summer with many forebodings of the effects which it would reveal of the dry, frosty spring they had experienced. But May and June were visited by a succession of genial showers, alternated by spells of fine, sunshiny temperate weather, which infused fresh vitality into the young vegetation, and brought the wheat fields up amazingly. The atmospheric conditions were just such as to promote a strong, even growth, and to discourage insect depredations.

In Middlesex and Oxford, in some rare cases, the wire worm was at work for a time, but it did not greatly injure the crop.

The aspect of their wheat fields in midsummer, judging from the joyful tone of the reports, must have been extremely comforting to the spirits of the farmers. Such phrases as "a wonderful crop," "extra good crop," "best sample for years," "a splendid crop," were common to the reports from all the counties of the group—from Oxford, Brant and Perth especially. Middlesex was the only county in this district in which the midge wrought any serious mischief, but almost exclusively in fields of Michigan

Amber and Egyptian; other varieties were perfectly healthy. A Westminster correspondent, alluding to this circumstance, stated in his August report:

There will not be five bushels to the acre left (of Egyptian), while the Democrat has proven midge-proof, and will on my farm yield, I believe, forty bushels to the acre.

Rust and weevil attacked the grain in spots, in wet soils, or where sown late, and wind and rain storms inflicted some damage in exposed localities in Wellington and Dufferin; but all of these mischiefs did not sensibly affect the general result of the crop.

At harvest time the wheat was reported to be everything that could be desired—in quantity, according to the acreage in crop, abundant; in quality, clear, hard, large and heavy. Throughout the greater portion of the district harvest work began about the 20th of July, and was so rapidly carried forward that, except in the northerly districts of Wellington and Dufferin, there was but little grain that was not safely housed by the 1st of August.

In threshing, the wheat justified the opinion of it formed at harvest time. Numerous correspondents asserted it to be the best sample of several years. A Blandford township, Oxford county, correspondent writes of his locality:

Fall wheat will average sixty-four pounds to the bushel: a neighbor of mine marketed a load that weighed sixty-six pounds to the bushel.

Similar accounts were not unfrequent for the West Midland district.

LAKE ONTARIO COUNTIES.

In the Lake Ontario district, and especially in the more westerly counties of the group, where fall wheat is largely grown, the crops stood the winter well, and in consequence the May reports to the Bureau were more decidedly encouraging than those from the other portions of the Province.

From the more or less adverse conditions which gave the reports a rather uncertain sound these counties appear to have suffered but very slightly; for though the frost destroyed some fields in a few northern townships and some patches elsewhere, owing to defective drainage, in most cases the only effect of the dry cold of April was somewhat to retard the growth of the plants, and generally speaking they entered upon the growing season backward but healthy. The warm rains which followed gave the crop a fine start, and thereafter its growth was rapid and vigorous. The acreage ploughed up was very small.

The August reports amply justified the prediction made in May, that the yield would be above the average in those counties in which fall wheat is generally grown, the crop proving, in the words of numerous correspondents, "the best for years" over the greater portion of Lincoln, Wentworth, Halton, Peel, York and Ontario. The reports from the more easterly counties were not so favourable, but, as already stated, as fall wheat is in most of them a comparatively unimportant crop, the general result was not seriously affected thereby.

The weather in harvest was almost all that could be desired, and except in late sown fields the crop was secured in fine condition and the sample was unusually good. The kernel was large, clear in colour, and heavy, not a few samples weighing as high as from 64 to 66 lbs. to the bushel.

Rust prevailed to some extent of course on late sown wheat, as well as that sown on low, undrained lands, and there were occasional traces of mildew caused by rains in the latter part of July, where considerable wheat was outstanding in stook, and the housing of grain in a damp condition, but these drawbacks were so exceptional in their character that they did not appreciably affect the general product.

In addition to the other favourable conditions which surrounded the crop in these counties, there was very little complaint of attacks by insect enemies. The weevil, midge and Hessian fly are all occasionally mentioned in the reports, but none of them apparently did any serious damage.

Some fields in Wentworth lodged considerably, rendering the crop rather tedious to

harvest, and to a less extent the same thing happened in Scott township, Ontario county, while in the north-western part of East Whitby, in the same county, a few fields were badly damaged by hail.

As will be noticed from the tables of acreage and yield included in this report, though the area under fall wheat in these counties was one-fourth less than in 1883, the aggregate yield was nearly double.

ST. LAWRENCE AND OTTAWA COUNTIES.

The acreage of fall wheat, never very great in the St. Lawrence and Ottawa counties, was decreased by more than one-half; a total of 31,534 acres having been under crop in the thirteen counties in 1883, against only 13,592 acres in 1884—an acreage considerably less than that of any single county west of Toronto except Dufferin.

When the snow fell the wheat had attained only a very slight growth, and much of it was winter-killed. In some places the tender plants were smothered by the heavy snow becoming crusted after the January rains; and after the snow departed spring frosts did greater damage than was the case in the westerly districts of the Province.

The May reports were rather variable, but the outlook, except in the case of occasional well-sheltered patches, was so discouraging that large areas were ploughed up and resown with spring grains. As a rule, light sandy loams were most successful; but some reports indicated heavy clay land, well drained, as being specially exempt from the general destruction. To many the failure seemed unaccountable, as to a correspondent in the township of McNab, Renfrew county, who wrote in May:

I do not know a good field of fall wheat in this township. It is nearly all ploughed up, and I do not know any difference as to soil. A few patches on new land are all that remain. All are at a loss to know the cause, as the season appeared favourable. The wheat appeared to rot in the ground, as the snow lay deep, and there was scarcely any frost in the ground.

The growing season was not so propitious in this district as in the western sections of the Province. In the counties bordering on the St. Lawrence there was considerable drought in June, which retarded growth and reduced the average yield. Owing to the various influences mentioned, only a fraction of the wheat sown in the fall survived to the harvest, and the average per acre of the product was less in these counties than in any other group. The loss in quantity was, however, partially made up by the invariably superior quality of the grain, which was clear and plump. Harvesting did not begin till after the 20th of July.

EAST MIDLAND COUNTIES.

The opening of spring found the fall wheat crop in these counties in varying conditions. In Victoria, in many places, the plants were thin and delicate, and the April frosts proved so destructive that the prospects at that time were anything but encouraging. In the southern portions of the county some fields which were well drained and sheltered emerged strong and healthy, but these were exceptional cases, and on many farms from 25 to 50 per cent. of the fall wheat was ploughed up. The outlook in Peterboro' was more promising, the plants having withstood the frost much better, and though little growth had taken place in the fall owing to the lateness of sowing, the fine rains which for a short time succeeded the frosty weather of early spring brought on the crop very rapidly and largely compensated for the previously unfavourable conditions. In the other counties fall wheat is not very largely grown, but where it was properly put in its appearance was not unpromising.

Taking the district as a whole, however, the May reports were not so hopeful, and, as generally happens in such a season, they were particularly unfavourable as to low-lying, undrained, and unsheltered lands.

The August reports were not much more cheerful in tone, their general purport being summarized in the following extract from the report of the Bureau issued for that month:

The severe winter left many fields so broken and thinned that they were ploughed up; a cold, backward spring followed, which in turn gave way to a somewhat prolonged period of dry weather. Under these circumstances the wheat in its early stage had a poor chance, and the result has been a

greatly thinned and shortened crop and an impaired growth of straw. There has been no trouble, however, from pests of any kind, and during the splendid growing weather of the past six weeks the plants have made marvellous progress and matured in fine condition. The result, summarized in the words of a correspondent, is that "the sample is good, likely to yield well in proportion to the straw, but below the average per acre." Nowhere is the quality of the grain spoken of but in terms of praise and satisfaction.

THE NORTHERN DISTRICTS.

In the northern districts of the Province fall wheat is cultivated only to a very trifling extent, and the farmers show a disposition to abandon it entirely. During the past season, however, the few patches sown yielded a good average of superior grain. Harvesting began about the 6th of August.

SPRING WHEAT.

The past year has been a remarkably successful one for spring wheat. The season opened early and the weather was favourable for ploughing and seeding operations, the absence of heavy rains enabling farmers to work the land easily. The only exceptions noted were in some localities in the northern and eastern sections of the Province, where seeding was delayed to some extent by cold and rainy weather in May. The failure of fall wheat and the comparative success of spring wheat in 1883 induced a greatly reduced acreage of the one, and an almost correspondingly enlarged acreage of the other, in 1884. In not a few instances unpromising fields of fall wheat were ploughed up in the spring, and spring wheat substituted. So extensive has this change been, chiefly in the western counties, that whereas the area under fall wheat in the whole Province in 1883 exceeded that under spring wheat by 511,000 acres, the excess in 1884 was only 143,000 acres. The conditions of the growing season were, as a rule, conducive to a fine development of both stem and head, though a June drought checked growth somewhat and left a deficiency of straw in the eastern counties of Lake Ontario and those along the St. Lawrence. Even in those cases, however, there was a fair average yield of grain, while in the western sections of the Province, where spring wheat is ordinarily a secondary and uncertain crop, the chorus of the reports is that it has been most successful—more so than for many years past. The yield has been more than a full average per acre, while the quality of the sample has been exceptionally high. The berry is commonly described as plump, clear in colour, and heavy. Deleterious agencies prevailed only to a very limited extent. The only complaint in this regard worthy of mention is of rust, which slightly impaired the quality of the grain, mostly in late-sown fields, in the west Midland, Lake Huron and Georgian Bay districts; the great spring wheat region of Eastern Ontario almost completely escapedthis visitation. The following comparisons, by county districts, will show the tremendous gain made by spring wheat in the past year, together with the averages per acre.

Districts.	1884		1883		Bush. per acre.	
	Acres.	Bush.	Acres.	Bush.	1884.	1883.
Lake Erie	15,583	303,300	6,825	100,200	19.5	14.7
Lake Huron	54,971	1,118,341	30,800	482,557	20.3	15.7
Georgian Bay	88,875	1,721,372	90,740	1,446,530	19.4	15.9
West Midland	125,939	2,758,626	71,952	1,236,353	21.9	17.2
Lake Ontario	214,892	4,457,729	172,884	3,143,444	20.7	18-2
St. Lawrence & Ottawa	122,865	2,512,207	122,452	1,806,645	20.4	14.8
East Midland	89,265	1,579,841	79,041	1,318,521	17.7	16.7
Northern Districts	9,257	158,245	11,716	191,813	17.1	16.4
Totals	721,647	14,609,661	586,410	9,726,063	20.2	16.6

LAKE ERIE COUNTIES.

Spring wheat is not extensively cultivated in the Lake Erie counties, but the acreage sown was nearly double that of 1883, and the results have been such as are likely to still further increase the breadth devoted to this crop in these counties.

From seed time to harvest the weather was unvaryingly favourable, being moderately cool, free from devastating storms, and marked by a succession of gentle showers, the result being that the growth was strong, steady and healthy, and the crop the best that has been reaped in these counties for years.

The quality of the grain was also excellent, the sample being plump and well coloured.

There was almost a complete immunity from both insect pests and frosts or other unfavourable atmospheric influences, only a few fields having been injured by May frosts, which slightly retarded their growth, and from wet and on low undrained soils. The only insect enemies noticed by correspondents in these counties was the Hessian fly, which, according to a correspondent in Southwold, Elgin county, destroyed about one-quarter of the heads of the Arnetka variety.

The heavy rains in the latter part of July rather retarded harvest operations, but the sample was not extensively injured by this cause.

LAKE HURON COUNTIES.

In the Lake Huron counties ploughing and seeding began somewhat earlier than usual, and were favoured with suitable weather, except in Bruce and the northern part of Huron, where cold and wet latterly interfered rather seriously with sowing operations, especially on low-lying lands. Still, the farmers, encouraged by the satisfactory returns of spring wheat in the previous year, greatly enlarged their area under crop; and, as the season happened to be an extraordinarily prosperous one for all spring grains, the harvest rewarded their venture.

During May and June, which were mild and humid months, the young growth made rapid progress. The same area in Huron and Bruce which had suffered from cold and wet at seeding time, was visited in July by drought, which retarded growth and shortened the aggregate yield slightly.

Many correspondents noted the presence of the midge, but added that it did very little mischief, and there were a few comparatively insignificant traces of rust. The average quality of the grain was first-class, showing a bright, plump berry, beautifully ripened. One correspondent in Turnberry, Huron, writes:

Quality good, except in some cases where spring wheat was put together in a damp condition, and therefore a lot of it is not marketable.

The general tenor of the reports, however, described the crop as a better one than any that had been reaped for eight or ten years. Harvesting was rather later than usual, not having been in full operation till between the 10th and 15th of August.

GEORGIAN BAY COUNTIES.

Though in the early part of the season there were a good many complaints from the Georgian Bay counties that the spring wheat had suffered considerably, both from spring frosts and drought, the returns after harvest showed a yield very slightly below the average for the whole Province; so it would appear that the damage produced by these and other causes only extended over limited areas, and having merely checked its progress their effects were largely overcome by the fine growing weather which supervened over the greater part of the district.

Seeding began early, and, except on low lands where operations were retarded by spring rains, the crop was got in in good season and in fine order.

In some localities the summer was rather dry, but the only observable effects were a shortening of the straw and a slight thinning of the crop; but as the remaining heads were unusually well-filled, and almost wholly free from insect pests, the result of the

drought, as stated in the August report, was simply to reduce what would otherwise have been a very heavy crop to about an average.

In some localities, of course, the recovery was not so complete, such, for instance, as in parts of the township of Glenelg, Grey county, where, partly owing to frozen seed and partly to the cold and wet weather in May, much of the seed did not grow, and the crop was rather thin, besides being somewhat injured by the wire worm. In other parts of Grey the May rains drowned out some low-lying fields; but, as already intimated, the combined effects of these various evils, as well as the rust complained of in late sown fields, was after all but slight in the aggregate.

WEST MIDLAND COUNTIES.

The West Midland counties, like other western districts, show a greatly increased breadth of spring wheat for the past season. The bulk of the increase has been in Middlesex, Oxford and Perth, which exhibit the following striking comparisons of acreages: Middlesex, 3,923 acres in 1883 against 19,603 in 1884; Oxford, 7,136 acres in 1883, against 19,064 in 1884; and Perth, 13,606 acres in 1883 against 25,081 in 1884.

The result of the year, too, has been such as fully to justify the increase in the area devoted to this cereal. Except in Dufferin and portions of Wellington and Waterloo, where cold and backward weather for a time retarded growth, the course of the season was such as to promote a vigorous growth and a perfect ripening of the grain.

All the correspondents, with scarcely an exception, concur in pronouncing the crop a really splendid one, both as to abundance and quality.

Rust, though somewhat widely prevalent, did not seriously injure the crop; and insect annoyances were almost wholly absent.

LAKE ONTARIO COUNTIES.

Spring wheat was sown on land in excellent condition in the Lake Ontario counties, and the weather in the earlier stages of its growth was favourable except in a few localities, chiefly in Northumberland and Prince Edward, where there was a good deal of cold, wet weather in the latter part of the seeding season.

The reports from the more westerly counties of the group were very favourable throughout the season, with the exception of some portions of Peel, in which the June drought impaired the crop and considerably reduced the yield, as it did also in some localities in Northumberland and Prince Edward.

On the rich clay loams of Durham county there was a very fine crop, but on the lighter lands both the straw and the heads were short, and the crop rather thin on the ground.

There have been comparatively few complaints of damage by insect pests in any of these counties. The midge was noticed in several localities, its operations being most conspicuous in the early sown wheat of the older varieties, and particularly the Scotch Fyfe, but its ravages proved to be in the aggregate far from serious. The Hessian fly and weevil were also noticed in a few instances, but the damage done by them was still more unimportant.

Rust attacked late standing fields, especially in the case of poorly drained lands, and there were also occasional traces of mildew, the result of rain in harvest time and the housing of grain before it was perfectly dry, but neither of these causes seriously affected the general result.

The area under spring wheat was nearly twenty-five per cent. greater than in 1883.

ST. LAWRENCE AND OTTAWA COUNTIES.

The area of spring wheat in the St. Lawrence and Ottawa counties is nearly ten times as great as that of fall wheat. The former appears less susceptible than the latter to the rigours of the more exacting climate of this district, and usually gives a larger average return. The past year has not been an exception to this rule.

A rather extended period of cold and wet weather in April and May interfered to some extent with seeding operations, especially on low land in the more northerly townships, while it at the same time prevented a speedy germination of early sown grain. But during the latter end of May and the early part of June several fine growing weeks intervened, which gave the plants a vigorous spurt, and promoted a large and healthy development of the ears. A period of dry weather followed, but its worst effect was to stunt the growth of straw, and to hinder full tillering, especially on high ridges. Then came a succession of fine moderate showering days, under whose benign influence the crop recovered marvellously.

Although the straw was short, and the date of harvest was postponed some days, in no instance was anything like absolute failure reported, and the aggregate yield was a full average.

The quality of the grain was unexceptionable. There was an almost complete silence on the subject of insect pests, rust, or blight of any kind, the only exception being that in two or three localities in Renfrew the weevil inflicted some trifling injury.

EAST MIDLAND COUNTIES.

The East Midland counties, especially in southerly localities, appear to have experienced to a greater extent than other districts the effects of drought in June and July, in shortening and thinning the stalks. The wheat ripened, however, with heavy and well-filled ears, markedly free, as a rule, from any injurious conditions.

A few correspondents only, in the Townships of Mariposa and Ops, in Victoria county, complained of rust.

Scarcely any damage was done by insects, the fine, cool weather that prevailed during the greater part of the summer not being favourable to their operations.

The grain was harvested in prime condition, and the threshing revealed an excellent sample.

THE NORTHERN DISTRICTS.

Spring wheat, which is a staple crop in the northern districts of the Province, did uniformly well last year. Cold rains and night frosts in May thinned a few fields in the Parry Sound district; but otherwise the crop was free from injurious agencies, such as rust or midge. At harvest, though the straw was short, the ear was full and plump, and the sample of grain threshed out was of very superior quality.

BARLEY.

As will be seen by the appended table, the area under barley was 700,472 acres, or 56,684 acres less than in 1883, while the total product was 19,119,041 bushels, as against 18,414,337, in 1883, an increase of 704,704 bushels. Like other spring crops of the season, barley was generally got in in good condition, and the plant made a fine start. The frosts of May and the drought of June did it some injury, but the weather in July was favourable and it made excellent progress up to the ripening season. In those parts of the Province in which the dry weather was most severe, as in the Lake Huron and Georgian Bay counties, and some of the eastern counties in which it is largely grown, the barley was short in both head and straw, though the berry was plump and heavy. The aggregate crop was considerably larger than in the previous year, as shown by the figures above given, the average yield being over 27 bushels to the acre. Unfortunately, however, owing to the showery weather in harvest the grain was rather badly discoloured over the greater portion of the Province, and for this reason the bulk of the crop did not rank higher than second grade. In some localities, particularly in those counties where it suffered most from the drought, it was fairly well coloured, and "light but bright" was a common report from these districts.

The following summary table gives the acreage, the total product, and the average yield for 1883 and 1884, in the various county groups:

Districts.	1884		1883		Bush. per Acre.	
	Acres.	Bush.	Acres.	Bush.	1884.	1883.
Lake Erie	39,021	1,079,938	38,607	815,073	27.7	21.1
Lake Huron	58,150	1,586,036	68,791	1,780,223	27.3	25.9
Georgian Bay	51,237	1,427,881	52,970	1,369,003	27.9	25.8
West Midland	120,375	3,688,955	132,940	3,460,207	30.6	26.0
Lake Ontario	259,546	7,118,983	267,271	6,297,813	27.4	23.6
St. Lawrence & Ottawa	96,274	2,298,211	107,753	2,477,255	23.9	23.0
East Midland	73,917	1,871,321	87,017	2,171,213	25.3	25.0
Northern Districts	1,952	47,716	1,807	43,550	24.4	24.1
Totals	700,472	19,119,041	757,156	18,414,337	27.3	24.3

Barley is not largely grown in the Lake Erie counties, but taking the district as a whole there was a fair crop, notwithstanding that in many places its growth was temporarily checked by frost in May. In Essex it was unusually good. The large yield and the fine plump berry are attributed to the cool summer, though the low temperature is regarded by some correspondents in other counties as an adverse condition. Generally speaking, the sample was rather dark, owing to the rains which prevailed in the last week of July, when comparatively little barley had been housed. A correspondent in Bertie, Welland county, reports slight injury by rust in some late sown fields, and a like report comes from Willoughby, in the same county. A correspondent in South Dorchester, Elgin county, writes: "I have heard some complaint of a kind of midge that has injured it some, but have not seen any." The presence of the grub is mentioned by a correspondent in Dunwich, in the same county, but the extent of its ravages is not mentioned.

The crop in Lake Huron counties was expected to be below the average, for, though the reports from a large portion of Lambton and Huron were very favourable, May frosts and summer drought appeared to have done considerable injury in some localities in both counties. Later reports showed, however, that these adverse influences were somewhat over-estimated. In Bruce they were the rule rather than the exception, and the result was that the yield in that county was decidedly below an average, The grain, when harvested, was generally reported as plump and bright, but in some parts of Lambton the sample was discoloured by rains, and the quality of much of the grain was rather inferior in this respect.

In the Georgian Bay counties barley was injuriously affected in the early stage of its growth by cold rains, and subsequently by the dry weather. It was generally good on land in good condition; short in the straw and head on high land, but the grain was plump and heavy; and on low or wet lands it was more or less patchy. The accounts, however, vary considerably according to localities. For instance, in the township of Collingwood, in Grey, it was excellent where it was sown early, but the late sown fields suffered from the drought; whereas in Glenelg, in the same county, what was sown early was permanently affected by the wet and cold spring, and the late sown gave an abundant yield. Taking the whole crop in the two counties, it was an average yield, and while the quality of the grain was good, it was discoloured by rains. Only in a few localities where it ripened early, as in the township of Innisfil, a portion was secured in fine condition.

The yield in the West Midland counties was considerably above the average for the whole Province. The reports from Middlesex were almost uniformly satisfactory. There a full average crop was harvested, and most of it put under cover in fine condition. Though the harvest was not so early in Wellington, the reports from that county were equally good. The reports from Dufferin were also very favourable. As to the remaining counties of the group, the bulk of the grain, though large and plump, was rather badly discoloured. Early frosts and summer drought were mentioned by several correspondents in Waterloo and Perth as having injured the crop, and even where the yield was nearly or quite up to the average, the straw was reported short. There was apparently little or no damage by insects or rust.

In the more westerly counties of the Lake Ontario group the barley grew well and the heads filled with plump grain, but the rains of the last week of July delayed harvesting and fully two-thirds of the crop was discoloured. In the easterly counties, where barley is the staple grain, the frosts of May and the drought of June proved to be very injurious, and the yield was considerably below the average in these counties. In Northumberland and Prince Edward especially the want of timely rains told severely on the crop, it being thin on the ground and short in straw and head. The July rains, however, improved its condition, and the grain was a bright and plump sample when reaping operations began. In some sections a portion was cut and housed in fine condition, but the bulk of the crop was caught in the shock by the rains of 28th and 30th July, and much grain was of course considerably stained. Many of the reports state that, saving the all-important question of colour, the barley was first-class and yielded well to the straw. On sandy and gravelly lands the drought and the hot week of June had a bad effect, but on strong clay loams the crop did not appear to suffer to any appreciable extent.

The reports for the St. Lawrence and Ottawa counties agree very closely with those for the Lake Ontario group. The growing of barley, however, is largely confined to the counties of Lennox and Addington, Frontenac, Leeds and Grenville and Dundas. The May frosts and the cold and dry weather of June arrested growth, and the barley was in consequence very short in the straw. The rains and fine weather of July made a great improvement in the crop, and an excellent quality of grain was matured. But in this district, as elsewhere, the showers that fell as the harvesting season opened stained the grain and considerably reduced its market value. In some of the northern counties the crop was not fit to cut before the fall rains, and there it was secured in better condition. Carleton gave the heaviest average yield of any county in the Province. In the southern counties cutting began in some localities as early as the 16th of July, but work was interrupted by broken weather.

Though a good average crop was reported in some parts of the East Midland counties, in others this was the exception rather than the rule. "Short and light" was the report made by too many correspondents, and it was frequently coupled with the remark, so commonly made all over the Province, that the sample was badly discoloured by harvest rains. The season was peculiarly unfavourable for barley in these counties. May frosts appear to have been pretty generally distributed, and these checked the growth of the plants at the start, especially the early sown. A long season of drought supervened, causing the grain to mature too rapidly—the result being short straw, and too often a light crop. Finally, the harvest season had only well begun when a spell of wet weather set in, of varying duration, but lasting sufficiently long over large portions of the district to seriously impair the quality of the sample.

The acreage of barley sown in the Northern districts is small, but the reports were almost uniformly favourable. Drought in June was complained of in a few instances, and frost by one or two correspondents, but the crop seems to have made a fair recovery from both these evils. The grain was large and plump.

OATS.

The cool, showery weather which was the rule of the past season, while highly favourable to all grain crops, was just such an atmosphere as oats are sure to thrive in. The oat crop of 1883 was an enormous one, and the mid-summer report of the Bureau expressed a doubt that it would be equalled last year, even though a considerably larger area was under seed; yet from the returns it will be seen that in regard both to the aggregate product and the yield per acre the harvest surpassed the one of 1883, while the grain was of a remarkably high quality. Indeed, it is probable that the Province of Ontario as a whole has never reaped in every respect so magnificent a crop of oats. Except in a few localities in northern latitudes, seeding time enjoyed auspicious weather, and being followed by copious rains the young sprouts issued forth rapidly. It was the unpromising condition of fields, which were sown too late to receive the benefits of these showers, that gave rise

to the apprehensions afterwards expressed. A good many farmers in Grey, Simcoe, Bruce, Dufferin, Wellington, and other northern counties, suffered loss from the use of the previous year's frosted seed. Drought in June shortened the growth of straw and induced uneven ripening, and some slight damage by rust was reported. But, fortunately, the aggregate of these various drawbacks had no important effect on the crop, which was greatly benefited by copious rains in July, and was generally garnered in prime condition. The following table shows the acreage, the product and the average yield per acre:

Districts.	1884		1883		Bush. per Acre.	
	Acres.	Bush.	Acres.	Bush.	1884.	1883.
Lake Erie	161,260	6,633,512	141,961	5,391,152	41.1	38.0
Lake Huron	161,711	6,143,688	157,617	6,210,757	38.0	39.4
Georgian Bay	130,164	4,512,399	128,889	4,769,645	34.7	37.0
West Midland	296,221	12,373,478	294,977	12,445,267	41.8	42.2
Lake Ontario	267,608	10,964,154	245,499	9,998,271	41.0	40.7
St. Lawrence & Ottawa	343,785	13,039,463	334,401	11,564,411	37.9	34.6
East Midland	105,250	3,506,965	99,571	3,667,930	33.3	36.8
Northern Districts	15,829	522,645	15,394	526,176	33.0	34.2
Totals	1,481,828	57,696,304	1,418,309	54,573,609	38.9	38.5

The oat crop in all the counties bordering on Lake Erie was a very abundant one, many correspondents say the heaviest for a number of years. There was occasional mention made of adverse influences—the frost last spring, dry weather in June and July, a blight that prevented a few ears from filling, the smut and the grub; but over the whole region the sum of the mischief wrought by all these causes together was quite insignificant. As a rule, the straw at harvest time was strong, clean, and standing thick on the ground; and the heads were well filled with a heavy, plump grain, free from disease. An immense crop of invariable excellence was secured in prime condition.

Throughout the greater portion of the Lake Huron district the crop showed a large average. Lambton, especially, gave an extraordinary yield, the only drawback having been the lodging and tangling of a few fields by wind and rain storms in certain exposed localities in the northern part of the county; but this mishap did not affect materially the general result. In Huron, the reports were only slightly less favourable; but Bruce farmers widely complained of the effects of the June and early July drought, which not only thinned the crop but left the straw so short in many instances as to making reaping difficult. The grain was well eared, however, and the quality good, though there was an occasional report of slight injury by insects. Harvesting enjoyed fine weather.

The accounts received from the Georgian Bay counties were extremely variable, but in general not nearly so favourable as those from their southern neighbours. Some fields at harvest time were reported to be so poor as to be hardly worth cutting, while others showed an unusually heavy growth—the contrast being attributed to late and early sowing respectively. It is probably safe to set down the crop in the aggregate as a low average. Where failure has occurred it is traceable to two main causes—first, to the dry weather of the early summer, which was much more widespread and injurious in its effects here than farther south; and, secondly, to the use by large numbers of the farmers of Grey of the previous year's frozen oats for seed. Much of this seed is also said to have become heated in the barn during the winter, so that it lost vitality. Under the influence of the timely rains of July, however, the crop made rapid progress and daily improvement, and as the grain was well headed and in healthy condition the final result was fairly satisfactory, though late sown fields suffered considerably from frost.

In the majority of the counties of the West Midland group the yield was well above the average. The cool, showery weather which prevailed during the summer, so agreeable to most spring crops, was just the thing for oats. The backwardness and coldness of the spring retarded growth for a time, and left the straw somewhat stunted, especially on late sown fields; but once the crop got a fair start it thrived wonderfully. The ears filled well, and there were no serious drawbacks in the shape of rust or smut. In some of the northern portions of Wellington, and very generally in Dufferin, much loss was sustained in

consequence of farmers, like those of Grey, sowing oats which had been frozen in the previous September. On this account many fields had to be ploughed up and resown, as many as three seedings being reported in a few instances. "The British Columbia oat," says a Dufferin correspondent, "was the only one that did not fail." Notwithstanding these reductions, the crop over the entire district was a high average. In most cases the oats were not ready for the reaper till well nigh the middle of August; in Dufferin, owing to late seeding, hardly before September. The quality of the grain was first-class.

In no other part of the Province are the farmers more gratified at the production of their oat fields than those of the Lake Ontario counties. Throughout the whole district the season was highly favourable to this grain. At first there were some fears as to the effects of early frosts and the succeeding dry weather, but these were gradually dissipated by the ensuing moderate temperature, interspersed with copious rains, which promoted a slow but vigorous and healthy growth, and gave assurance of a really magnificent return. There was a general shortage of straw, but the heads of the grain were very long and full, and every county showed a yield equal to the average of past years, while in the majority the average was surpassed. The quality of the oats, too, was high; absolutely no complaints were made of insect pests, and very few of mildew or rust. Of course there were a few deficient fields, either because of their location or the nature of the soil, or because they matured too early to secure the full advantage of the later showers. Some of the farmers of Caledon township, in Peel, ventured to use frozen seed, with the same fatal consequences that followed the experiment elsewhere. But altogether the crop was a very fine one.

Oats is one of the standard crops of the St. Lawrence and Ottawa district, and the farmers were enabled to rejoice in an immense yield. At one time, indeed, owing to the drought, which was somewhat prolonged in this district, the chances were rather precarious. "If the drought had continued a week longer," said a correspondent in Grenville county, "the crops would have been nearly ruined, but the copious rains which began about the 4th of July have worked like a miracle. Early oats, which were short, shot forth a fair length and are well headed. They promise to be a fine crop. The farmers are taking heart at the prospect." The worst effects of the drought were a deficiency of straw, so universally alluded to, uneven ripening and a delayed harvest. There were a few failures in Renfrew, in some of the northern sections of which the oats did not recover from their poor start in the spring. Late sown fields were somewhat damaged by August frosts, and there were also a few cases of smut. Otherwise the grain was reaped in good condition, and was of superior quality.

The reports for the East Midland and Northern districts do not warrant a more favourable verdict than simply a fair crop; on the whole, probably something below an average. The effects of both frost and drought were more seriously felt throughout the greater part of this region than in most other sections, although a succession of welcome showers in the latter end of July wonderfully brightened the prospect, especially in the case of the later sown fields. In Victoria and Peterborough a hail storm threshed out considerable quantities of the ripening grain. A stunted growth of straw was the universal experience here as elsewhere. The use of frosted seed grain caused considerable failure in Parry Sound and Algoma. The quality of the crops, however, was commonly described as first-class.

RYE.

Rye is by no means a popular cereal among the great mass of the farmers of Ontario, owing to its unprofitableness compared with other grains, and there appears to be no disposition to increase the area devoted to its cultivation. Except in a few easterly and northerly counties, where it has for years been a staple crop, rye is found only in sparse and occasional small patches, and is grown not so much for grain as for pasturage and soiling purposes. Last year the acreage was largely reduced in every district of the Province, and the crop was only fairly successful. In several of the St. Lawrence and

Ottawa counties there was considerable winter-killing, owing to the formation of icy crusts on the ground, and throughout the same district, as well as in the Lake Ontario counties, spring frosts and the extended drought of June left the plants in many instances rather thin on the ground and much of the grain seriously shrunken. Slight traces of rust and midge were observable in one or two counties in the extreme west. Apart from the exceptions noted, the quality of the diminished yield was good. The statistics of the rye crop for the past two years are as follows :

Districts.	1884		1883		Bush. per Acre.	
	Acres.	Bush.	Acres.	Bush.	1884.	1883.
Lake Erie	11,452	183,105	12,313	175,081	16.4	14.2
Lake Huron	537	8,722	2,114	29,635	16.2	14.0
Georgian Bay	2,445	40,293	5,816	97,864	16.4	16.8
West Midland	4,026	72,762	8,084	116,668	18.1	14.4
Lake Ontario	29,989	439,319	61,234	887,721	14.6	14.5
St. Lawrence & Ottawa	39,433	667,652	63,475	1,158,848	16.9	18.3
East Midland	14,381	211,730	33,091	506,605	14.7	15.3
Northern Districts	1,153	24,676	1,984	39,818	21.4	20.1
Totals	103,416	1,648,259	188,111	3,012,240	15.9	16.0

COMPARISON OF AVERAGE PRODUCTS.

In the reports for 1882 and 1883 a comparison was made of the average yield of the foregoing cereal crops between the Province of Ontario and the principal grain-growing States of the American Union, showing that Ontario held the first place as a producer of high averages. The following table gives the record for the last three years :

	Fall Wheat			Spring Wheat			Barley			Oats			Rye		
	1884.	1883.	1882.	1884.	1883.	1882.	1884.	1883.	1882.	1884.	1883.	1882.	1884.	1883.	1882.
Ontario	24.0	10.6	26.3	20.2	16.6	16.5	27.3	24.3	28.6	38.9	38.5	36.4	15.9	16.0	18.7
Ohio	15.3	9.5	16.7	....	....	....	26.0	21.0	19.9	29.0	34.0	28.0	13.5	13.7	15.8
Michigan	14.0	12.0	17.3	....	....	....	23.0	21.0	25.2	32.0	36.7	33.3	13.0	12.0	17.0
Indiana	13.2	10.4	15.7	....	....	....	23.0	20.4	24.0	30.0	30.5	27.0	13.0	11.5	15.1
Illinois	12.6	10.0	16.0	....	....	....	24.0	26.0	22.5	33.0	33.0	37.4	13.8	15.0	16.6
New York	16.5	11.0	18.7	....	....	....	23.0	24.5	25.0	30.0	32.0	34.2	13.0	14.0	16.2
Pennsylvania	15.0	13.5	15.5	....	....	....	19.0	25.0	23.5	28.0	33.0	27.8	12.5	14.0	15.8
Iowa	....	....	....	12.5	12.7	11.0	23.0	23.6	21.7	32.0	36.0	31.8	15.0	15.5	14.3
Minnesota	....	....	....	16.1	13.2	13.3	26.4	24.0	23.3	35.3	37.0	40.0	17.0	16.5	18.0

In the three successive seasons the conditions of weather were as nearly as possible uniform there and here, and for each season the averages in Ontario are, with one or two unimportant exceptions, higher than in any of the States. The knowledge of this fact ought to have a valuable influence at home as well as abroad, for until recently the opinion has largely prevailed that for productiveness of soil Ontario compared very unfavourably with several of the neighbouring States. But it is now seen that our Province stands ahead of them all, and there can hardly be a doubt that as an agricultural country in the general sense it is not surpassed by any other portion of country of equal extent on the continent. It costs just as much to grow an acre of fall wheat in New York, Michigan or Ohio as in Ontario, and it is with wheat as with everything else—the last few bushels of produce determine the profits of the industry. Up to a certain yield it only pays for production, and what exceeds that goes to make profits. Now, applying this doctrine, we learn that for each of the last three harvests the farmer in Ontario had an advantage in profits of five bushels per acre over the farmer in New York, of six bushels over the farmer in Michigan, and of six and one-half bushels over the farmer in Ohio. I may add that the American figures of average yield are taken from the Reports of the United States Department of Agriculture, and, like our own, they are computed from the reports of threshers and the careful estimates of correspondents.

PEAS.

The pea crop for the past season was by far the largest and best that has been reaped in the Province for a good many years. With very few exceptions the reports from all over western and central Ontario indicated that not only was there a considerably greater breadth sown than has been usual of late years, but the vines were long, vigorous, and extremely well podded. What is still more gratifying is that from almost every one of those counties in which the pea bugs have been prevalent for a quarter of a century, there comes the intelligence that it was either altogether absent last year, or, if present at all, to a far smaller extent than for several years. This feature of the reports is so common as to be very significant. The only county west of Toronto which forms anything like a general exception to the rule in regard to the excellence of the crop is Bruce, where the plant suffered rather severely from the drought; but taking even this county as a whole, the yield, as the tabulated returns indicate, was very little below the average. In the St. Lawrence and Ottawa and East Midland counties the reports were not quite so uniformly favourable as in the western peninsula and central Ontario; but the exceptions were comparatively so few and the favourable reports so very favourable, that even in these counties a yield very slightly below the average for the province was reaped. From many of these counties there was also reported a decided diminution in the ravages of the pea bug, and the fear sometimes expressed before the crop was reaped that it might turn up at the eleventh hour appears not to have been realized to any considerable extent. The reports from the northern districts were also very favourable.

The above forms an accurate summary of the great bulk of the reports received by the Bureau, and the exceptions may now be more particularly noted.

Wet weather just before harvest mildewed the vines in a few localities in different parts of the Province, and the Army worm did some damage in Russell, Renfrew and Victoria counties; but neither these enemies nor the rust, which also was present in some cases, did serious injury to the crop. There were also occasional complaints throughout the whole Province that the drought impaired the crop by hurrying it to early and imperfect maturity, more particularly in the eastern counties, where the early sown suffered to some extent from this cause, and the late escaped with little or no damage.

Wet spring weather, which scalded out the plants, and May frosts, are each the subject of a few complaints; but in the aggregate, like the other exceptions noted, they were apparently of trifling extent. One correspondent in Peel township, Wellington county, and another in Albion, Peel county, mention that the crop was somewhat damaged by a hail storm in the latter part of July. Local hail storms also did some damage by threshing out the peas in portions of Peterborough and Victoria counties.

The statistics of the crops of 1883 and 1884 are presented in the following table:

Districts.	1884		1883		Bush. per Acre.	
	Acres.	Bush.	Acres.	Bush.	1884.	1883.
Lake Erie	41,337	961,956	36,471	596,572	23.2	16.4
Lake Huron	64,047	1,541,273	67,609	1,357,404	24.1	20.1
Georgian Bay	74,504	1,832,321	69,852	1,608,421	24.6	23.1
West Midland	103,791	2,684,556	108,829	1,769,235	25.9	16.3
Lake Ontario	126,784	3,083,994	114,564	2,394,282	24.3	20.9
St. Lawrence & Ottawa	104,749	2,373,579	93,056	1,884,569	22.7	20.3
East Midland	48,855	1,045,548	44,667	896,469	21.4	20.1
Northern Districts	5,861	168,380	7,723	166,771	24.5	21.6
Totals	570,928	13,691,607	542,771	10,673,723	24.0	19.7

BEANS.

Beans are cultivated in Ontario on a comparatively limited scale only. Nearly every vegetable garden has its little patch for home consumption, but as a field crop they are confined to a few occasional places where some local or exceptional circumstances, such as proximity to a lumber district, create a demand for them, or where soil and climate

are especially favourable to their growth and maturity. Though an increased acreage was planted in some counties, the area under beans in the whole Province was slightly less than in 1883. The principal drawback from which the crop suffered was that the prolonged period of cool weather which prevailed early in the season caused rather a slow growth, but, as the plants continued strong and healthy, the worst effect of this was merely to delay the period of ripening for a short time. Warm and genial weather followed in August, and the result was that the yield has generally speaking been good, and, as in the case of corn, they have been most prolific in those localities—and they are comparatively few—in which beans are an important field crop. In the Lake Erie counties they were almost invariably harvested in fine condition. In a few instances they were injured by rain and drought in the early part of the season, and in a few others they are reported to be somewhat discoloured by rain. Damage by wet weather in harvest appears to have been more extensive in central and eastern Ontario than in the west, but in no part of the Province does the crop seem to have been anything like a failure, except, perhaps, in the north and extreme east, where early frost and late rains proved fatal in many localities. In even those counties, however, the area under this crop is comparatively small.

The acreage under crop was 24,878, giving a product of 592,044 bushels, or 23.8 bushels per acre. The area under beans in 1883 was 25,907 acres, but the crop was ruined by early frost.

INDIAN CORN.

The returns made to the Bureau in August were very unfavourable as to the condition of the corn crop, and, as remarked in the report for that month, the prospects were "least promising in those counties in which corn is most largely grown." Good seed was so scarce that an inferior article had to be planted in many cases, and the result was that all over the Province the crop started at a great disadvantage, and many fields were ploughed up and sown in buckwheat and other crops. The cut worm, the wire worm, and grubs of various kinds and colours, also seem to have conspired in unusual force against the plant, especially where sown on sod: and when to these unfavourable agencies is added the fact that the cool weather of early summer retarded growth it would seem rather wonderful that there should be a prospect of a corn crop at all. It was at the same time pointed out that in many cases the crop appeared to be making a surprisingly good recovery from the combined effects of these various agencies, and the reports made to the Bureau in November showed that the recovery proved to be far beyond all expectation—that, in fact, the crop was an extremely good one. Another fact very manifest from the later returns, and one which fortunately was directly contrary to the prospects in August, is that the crop was best in those counties in which corn is an important staple, namely, the three or four most westerly of the Lake Erie group. The grain was large, hard, well-ripened and well saved. In the other counties of the Province in which it is grown to any considerable extent as a field crop, and particularly in Haldimand, Welland, Lincoln, Wentworth and Middlesex, the reports were scarcely less favourable. In Lambton, also, the crop was a fairly good one in most parts of the county, though in some localities it was injured irrecoverably by the frost in the latter part of May, and subsequently by warm weather. In Huron the crop was rather poor, except on moist and well-manured soil. From the central and easterly counties of the Province, in most of which corn can scarcely be reckoned a regular field crop, the reports were on the whole surprisingly favourable as to the condition of the crop, though frost did a good deal of damage in some localities, and more particularly in the counties lying at the extreme east of the Province. The acreage planted in 1884 was 174,560, giving a total product of 12,935,889 bushels, as against an acreage of 214,237 in 1883, and a yield so poor on account of the early frost that it was not worth computing.

SORGHUM.

Except in some parts of the Lake Erie counties, and particularly in the county of Essex, where it has been grown for a number of years, the growth of sorghum is as yet hardly past the experimental stage in Ontario. The reports to the Bureau would indicate, however, that it is being attempted as a field crop to a larger extent than is generally supposed, and it is to be regretted that the past season did not prove more encouraging to these experiments. From the Lake Erie counties the reports were very favourable, but frost and dry weather proved fatal to the plant in most other places where it was sown, especially in Waterloo. In Essex the reports state that a good quantity was grown and that the quality was excellent, especially near the lake shore. A correspondent in Orford, Kent county, writes: "Sorghum was larger than usual in quantity, and specially good in quality, and has all been cut without material damage." Another, writing from Harwich, in the same county, says: "Amber sugar cane is being quite largely grown here. Nearly every farmer has a piece. The only drawback is the lack of manufacturing capacity. Syrup made from it at a trifling cost is superior to any sold—maple syrup excepted." Another in Zone, in the same county, says: "Sorghum is becoming a useful article for syrup. I have a mill and am making syrup—would not be without it. There are twelve mills in this county." In Bosanquet, Lambton county, "a little was sown, but it did not ripen well, owing to the cold summer." In Huron, Oxford, Perth, Waterloo and Prince Edward, frost was assigned as the cause of failure. On the other hand, a correspondent in Egremont, Grey county, says: "I tried a small patch of sorghum, and it grew seven and a-half feet high." Another writing from Otonabee, Peterborough county, says: "There is some sorghum grown in this township, but the season was not warm enough to bring it to perfection to make the seed ripen, or our climate does not answer it. There was no frost till the middle of October." Several correspondents in the western part of the Province say that the cane would be more extensively grown but for the absence of appliances for its manufacture.

BUCKWHEAT.

The reports as to the yield and quality of the buckwheat crop were rather unfavourable, though the return of actual yield showed that the anticipated failure was somewhat exaggerated as to quantity, though the quality was certainly far below the average. In some counties in the eastern part of the Province it was largely a failure, owing mainly to frost. In the west, though the reports were more favourable, a good deal of damage was done by wet weather in the Lake Erie counties, and by frost and rain combined in other localities in which it is grown. Too dry weather is occasionally mentioned as doing damage to the crop. A correspondent in Mersea, Essex county, says: "I had buckwheat sown on wheat stubble after harvest, and it ripened all right." The area sown was 65,836 acres, giving a total yield of 1,484,570 bushels.

HAY AND CLOVER.

About the beginning of May the clover fields of the Province were everywhere full of promise, and farmers confidently expected a repetition of the previous year's extraordinary yield. The season of 1883 was highly favourable to the growth of the newly-seeded plant, and enabled it to secure a fine "catch" on the soil before the advent of the cold weather. Winter was ushered in by a heavy fall of snow, which remained in most parts of the Province until spring, and then departed so gently as to leave but little frost in the ground; so that the clover began the season well-advanced, healthy and robust. When the cold and frosts of April came it was fortified against them, and emerged from the ordeal much more successfully than the fall wheat. Under the stimulus of the succeeding rains, the

clover fields developed their growth very rapidly until a sudden check was given by the blasting frost which swept the Province in the last week of May. This and the June drought so thinned and shortened the crop as to disappoint the bright anticipations entertained at the beginning of the season. Yet, taking the Province as a whole, the yield was a satisfactory one; the quantity was a fair average, while the quality was invariably pronounced to be excellent. Timothy was rather stunted; but the fine cool weather which prevailed during most of the summer promoted a remarkably healthy curing of the crop. The old meadows, as usual, were the greatest sufferers from frost, especially on low or heavy clay soils, where a great many roots were heaved out; new meadows were often strong enough to recover almost wholly. The worst effects of frost and drought were experienced in the northern and eastern sections of the Province, as in Bruce, the Georgian Bay district, the northern parts of Wellington and Dufferin, and the East Midland and St. Lawrence and Ottawa districts; along the borders of the lakes and in the greater portion of the West Midland counties the yield was heavier. In a good many instances clover that headed well enough failed to blossom, which some correspondents attributed to the midge and others to the frost. A Waterloo correspondent recommends the use of plaster on clover fields, remarking that "where it was sown in the spring the clover crop was good, and suffered no perceptible injury from frost." Haying operations, though several days later than usual, were generally favoured with cool, dry weather, and the crop was garnered in splendid condition. Only a few complaints were made on this score, from some localities in the Ottawa district, in the case of later fields which were not cut until the weather became broken. The statistics of the past two years are as follows:

Districts.	1884		1883		Tons per Acre.	
	Acres.	Tons.	Acres.	Tons.	1884.	1883.
Lake Erie	271,690	436,517	294,999	461,251	1.61	1.56
Lake Huron	220,239	294,902	239,977	385,921	1.34	1.61
Georgian Bay	181,877	240,119	194,121	321,106	1.32	1.65
West Midland	395,809	629,716	450,492	850,292	1.59	1.89
Lake Ontario	412,689	603,359	452,870	788,816	1.46	1.74
St. Lawrence & Ottawa	521,766	614,509	523,069	985,006	1.18	1.88
East Midland	151,379	180,642	153,990	259,855	1.19	1.69
Northern Districts	37,920	45,148	41,451	63,288	1.19	1.53
Totals	2,193,369	3,044,912	2,350,969	4,115,535	1.39	1.75

CLOVER SEED.

The clover seed crop was everywhere an extremely disappointing one. The flourishing appearance of the fields under the influence of the fine showery weather of midsummer excited high hopes in the minds of the farmers; the second crop was making a vigorous growth and heading well, and, though there were traces of midge, it was believed that the healthy condition of the clover would enable it to successfully resist this insect's attacks. But the second brood, which develops in August, proved to be so great and so generally destructive that the year's yield of seed was very deficient. Many farmers did not consider their crop worth threshing, and numerous fields were pastured off or ploughed under. The suggestion conveyed in the 1883 Report, to pasture clover fields until the beginning or middle of June and then leave them to ripen for seed, was pretty widely adopted last year, and with invariably favourable results. Wherever this plan was followed the midge was rendered harmless and a fair yield of seed obtained, while surrounding fields were utterly stripped. In view of the success attending this experiment there would seem to be no reason why any farmer should become discouraged, as appears to be the case in a good many instances, from the attempt to grow clover seed. Large clover and alsike, where grown, are reported to have been very good.

Essex and Kent, which apparently enjoyed greater immunity from the midge than the other Lake Erie counties, showed some fine yields of seed, in quantity sometimes as high as six bushels to the acre, and of first-rate quality; and isolated localities in other counties made a fair approach to this record. Taking the district as a whole, however, it

is doubtful if the yield can be set down as even a low average. Occasionally, where the first crop was cut very early, there was a fair product of seed from the second, but the rule is that the cutting of the first crop ensures the destruction of the second crop by the midge. The invariable testimony is that the only really safe course is to pasture the clover until June, and then, instead of cutting it for hay, to leave it to ripen. In no case is this plan reported to have failed in promoting a fair yield of midge-proof seed. The large clover and alsike appear to have done well under all circumstances, even where the small red failed. Grasshoppers did some damage in Essex and Kent, and a Walpole (Haldimand) correspondent mentions that "a white maggot has eaten some seed after it was housed."

Discouraged by the former year's failure, the farmers of the Lake Huron counties made fewer efforts to grow clover for seed last year. Lambton is the only county of the three which returned anything like a crop, and even there it was light, owing to drought and midge combined. The insect appears to be gradually extending throughout the St. Clair peninsula. A Brooke (Lambton) correspondent writes: "This is the first year that the clover midge has done any serious damage, but the present crop is almost completely destroyed." It was as active as ever, however, in Huron and the southerly townships of Bruce. The summer drought was fatal to the second growth throughout the entire district; it grew so scantily and blossomed so rarely that it was very generally pastured off.

Seed clover was almost a total failure in the West Midland district, owing to the universal prevalence of the midge. The second crop headed satisfactorily, and although the midge was present it was not greatly feared; but the second brood, which hatches out in August, proved to be even more destructive than in the previous year. A great many correspondents reported the clover not worth threshing; in other cases it was not even cut, as it failed to blossom, and the cattle were turned upon it. The ravages of this dire insect have been so disastrous during the past two or three years that in many places farmers, in their discouragement, are abandoning the attempt to grow clover for seed. In some localities, notably in Waterloo, drought aided the evil influence of the midge. Wellington and Dufferin do not, to any great extent, attempt to produce seed. A Dufferin correspondent says: "Cattle are always put on the second growth of clover for fattening—it pays us best."

The same tale of destruction from the same cause comes from the Lake Ontario counties. The season was so favourable for vegetation that the clover fields made a thick and heavy growth; in the second crop the straw and leaf developed abundantly; but themidge prevented blossoming, so that the aggregate supply of seed was extremely scanty. Many farmers have not thought their clover worth threshing, and either left it for pasture or garnered it merely for fodder. Here, as elsewhere, however, the fields in which cattle had been pastured in the early summer, and which had then been left for seed, were invariably able to resist the August brood, and to give a satisfactory return. The large red clover and alsike, where grown, are both reported to have matured successfully.

There is scarcely any seed clover cultivated in the St. Lawrence and Ottawa counties. The farmers usually purchase their supplies of seed from abroad, preferring to devote their clover crops to pasturage or hay. Probably for this reason the midge is not a subject of camplaint in this district. The only drawbacks referred to were frosts in May and early in June, which shortened the crop in some localities, and the grasshoppers.

Only the southerly townships of the East Midland district produce clover seed, and in these it has very generally failed last year. Droughts in summer and early frosts both injured the crop somewhat, and an Asphodel, Peterborough, correspondent says "heavy grains kept it growing so that it did not ripen before the frost came;" but its chief enemy was the midge, which prevented the heads of the second crop from filling.

The occasional localities of the Georgian Bay and Northern districts which raise clover seed have, in common with every other section of the Province, suffered greatly from midge. The growth of the second crop was also somewhat retarded by dry weather which succeeded the haying season. The product of seed was therefore on the whole very small. September frost blasted some late standing fields.

ROOTS.

The reports on most of the root crops of the Province made to the Bureau in August were so varying, even in contiguous localities, that, as was remarked in the report for that month, it was difficult to make any general statement with regard to them. There was one exception, however, and that with reference to the most important in this class of agricultural products. Leaving out of account Bruce county and the northern part of Huron—where the drought proved too severe—and a few more limited areas elsewhere, the potato crop of the Province promised to be very considerably above the average, both in quantity and quality, and this promise was fully realized by the actual returns. A larger acreage than usual was planted, especially in the west, and there was an abundant yield of tubers of superior quality. In fact in some localities the surplus was so large and the price so low that farmers have been feeding them to their stock. An occasional report from the western peninsula stated that potatoes were a light crop, but that the quality was good and that, as in every other part of the Province, they were generally secured in fine condition. A few cases of rot were reported from Norfolk, and several correspondents in the counties of Prescott and Russell state that the potatoes began to rot pretty badly soon after being gathered.

Though the yield of turnips was, perhaps, on the whole, somewhat better than was anticipated when the August report was issued, owing to the effects of favourable weather during that and the following month, yet the average for the Province, though nothing like so low as in 1883, was considerably behind that of the preceding year. Dry weather in the early part of their growing season was the main cause which produced the damage, though there were occasional reports that the turnip fly and other insects contributed their share to that result. Turnips were generally rather small in size, and dry and hard in quality.

The comparative failure of the turnip crop was, however, to some extent compensated for by the fine yield of mangolds, as was the greater failure of the turnip crop in 1883. Mangolds were a good crop in almost every part of the Province, the yield being the best for several years past. The acreage devoted to this root appears to be steadily increasing, and in not a few localities it is taking the place of turnips in the feeding of stock. Though the plants suffered to some extent from the dry weather, they appear to have made a far better recovery than turnips, and at the same time were remarkably free from attacks by insects.

Carrots were also reported a good crop, considerably better than the previous year, though not equal to that of 1882.

The root crops do not appear to have sustained any very widespread damage from the various insect pests which prey upon them, but as usual their presence was felt to some extent. The turnip fly appeared in isolated localities all over the Province, and though some fields were reploughed on that account the damage in the aggregate does not appear to have been large. The potato beetle, though reported in decreased numbers in some localities, was apparently more numerous than ever in others; but Paris Green is now considered so certain a specific against the ravages of this insect that its presence is generally alluded to in a patronizing, half-jocular manner, as a necessary and interesting but not very formidable evil.

Special enquiries were made with a view of discovering to what extent the mangold crop suffered from an insect whose presence was reported to the Bureau for the first time early in the summer. It deposits its eggs on the under side of the leaf, and when the larvæ are hatched out they enter the leaf and feed upon its soft tissue. Though the numerous correspondents of the Bureau appear to have made a dilligent investigation, it is gratifying to note that this new pest was only reported present in a very few localities, and that the damage it has done thus far was but slight. One correspondent in York township, York county, wrote: "Mangolds and beets are affected by a worm in the leaf—the mangold insect, according to the Natural History Society, of Toronto. The second brood is now upon the tops, but as yet they are not badly injured." Another writing from Alnwick, Northumberland county, in July: "The mangold insect is here, but not in sufficient numbers to do any serious damage yet." A correspondent in Ameliasburg,

Prince Edward County: "Heard nothing of the mangold insect this year. Last year it destroyed three-fourths of my mangolds." Another in Tossorontio, Simcoe county: "Some talk of the mangold midge." Another writing from Pilkington, Wellington county: "A few *grubs* have appeared on the mangolds;" and a Somerville, Victoria county, correspondent; "I have seen the insect, I think, on the beets, and I hear of it on the mangolds. It was going hard with the leaves in the dry weather, but they seem to have recovered since the rain." A yellow-striped caterpillar is mentioned by a correspondent in Moulton township, Haldimand county, as eating the leaves of the mangolds, but not injuring them much. A correspondent in Huron township, Bruce county: "Turnips were very much injured by the butterfly; in some cases nothing being left but the ribs of the leaves." Another writing from Goderich township, Huron county: "Turnips suffered a good deal during the dry weather from the leaf lice or aphis, but our friend the lady-bird followed them pretty closely." A correspondent in Walsingham township, Norfolk county: "Farmers are boiling up potatoes to fatten hogs with—only worth fifteen to twenty cents a bushel here." Another, writing from Ennismore, Peterborough county: "Turnips were badly destroyed by the green cabbage worm."

The acreage and produce of the several root crops for 1883 and 1884 were as follows:

	Acres. 1884	Bush. 1884	Acres. 1883	Bush. 1883	Bush. per Acre. 1884.	Bush. per Acre. 1883.
Potatoes	168,757	27,546,261	166,823	16,400,782	163.2	98
Mangolds	18,341	8,655,184	17,219	6,252,015	471.9	363
Carrots	10,987	4,197,200	11,270	3,984,436	382.0	354
Turnips	104,199	44,406,363	98,429	29,879,354	426.2	304

NEW VARIETIES OF SEED.

While the general disposition of the farmers of Ontario is to rely on old and well-known varieties of seed, which have stood the test of experience, and to be suspicious of violent or sweeping changes, there is constantly going on a considerable amount of experimenting. This is an exact description of the condition of affairs during the past year; there has been no very marked departure from the established order of things, yet, in a tentative way, a great diversity of grain, especially of wheat and oats, was grown in the country.

Varieties of wheat are sometimes reported new when they are only new locally, as, for instance, White Russian, White Fyfe, Lost Nation and Egyptian, all of which, though known for a number of years in many parts of the Province, are just in course of introduction in other localities, and are there spoken of as new. The loose nomenclature that prevails, too, causes a good deal of confusion, various names being applied to what is evidently the same kind of wheat. White Fyfe appears to be a rather popular spring wheat: it is now grown in many sections of the Province, and is said to be well adapted to succeed here. It is bright in colour, yields heavily, and makes flour of such prime quality that it commands a high market price; a Simcoe county correspondent says the millers there give ten cents a bushel more for it than for any other kind.

Among the new varieties of fall wheat, Michigan Amber and Democrat are most numerously referred to. The former is generally commended, a Norfolk correspondent stating that it stands the winter better than Clawson or Delhi; the latter is not yet pronounced upon. An Essex correspondent mentions the Boyer or Findlay fall wheat, which was introduced there last year, as having "withstood all insect attacks in the fall and the severe cold of last winter better than all the other kinds sown, and at present it looks very healthy and vigorous." Last spring a good many farmers in Huron, in Bruce, in some of the West Midland counties, and in those of the Ottawa group, sowed Manitoba wheat, which is reported to have done moderately well. It is rather premature yet to pronounce positively on the experiment. Other varieties mentioned are: In Grey, the Fleming, which is said to yield well; in Northumberland and Ontario, French wheat,

which produces a good crop of grain and a heavy straw; and in Peterborough, the Colorado, which is much favoured. The Defiance and the Champlain are grown in Grey and Simcoe, and both are commended. The Redfern, the Red Chaff, the Golden Drop, etc., are grown in several counties.

Several new varieties of oats are reported, the White Russian, or White Polish, receiving, perhaps, the most attention. A Waterloo correspondent, who appears to have watched this variety somewhat closely, states that "it is about two weeks earlier than any other kind grown here, and weighs about fifty pounds to the bushel, but it must be cut before it is quite ripe or it will come out in poor condition." If reports are true, this oat will be a great benefit to the country, as it is so early that it gets ahead of all weeds and prevents the seeding of Canadian thistles. The White Egyptian or double-headed oat is also highly commended as an early and heavy cropper, and as weighing fifty pounds to the bushel, though inferior in quality to some other varieties. The Early Cluster, a bright, white-coloured grain, is acquiring a good reputation in Wellington, and in one or two other counties; it has a strong straw, grows rapidly, yields heavily, and weighs forty-eight pounds to the bushel. Other varieties of oats reported as new are: In Lambton, the Australian; in Huron, the Tartar, the McAlister, and the Egyptian; in Bruce, the Black Austrian, a good yielder with a strong, stiff straw; and in Dufferin, the British Columbian and the Arabian, which were experimented on last season.

Black barley was largely sown throughout the country last year as a substitute for peas for feeding purposes, and gave a favourable account of itself. Experiments are being made with White Russian barley, but they are not yet sufficiently advanced for an opinion to be based upon them. In York, however, this grain did not bring the top price last year. A Brant correspondent reports that Rennie's Improved is grown there in a few localities, and is proving to be "a grain of fine quality, very heavy and plump."

Owing to the failure of the corn crop in 1883 the farmers complained of a great deficiency of seed for the last season's planting; and what remained of the year's growth was so inferior in quality that many planted old seed in preference, while others tried the rather hazardous experiment of planting American corn. In the corn belt lying along Lake Erie the majority of the farmers were compelled to purchase their supply of seed corn from the seed stores, where they have to pay various prices ranging from $1 to $3 per bushel. At some points in Oxford and Middlesex as high as $4 was said to have been paid.

Prussian clover has been introduced in Norfolk, and Alsike appears to be increasing in favour.

The cultivation of the potatoe in Ontario is characterized both by wide diversity and by close uniformity—diversity, in the scores of varieties grown, each with its enthusiastic champion;—and uniformity, in the fact that among them all there are two or three which are everywhere regarded as the standard and staple varieties. The Early Rose and the Late Rose still predominate, although some allege them to be deteriorating, and to require replacing. The Beauty of Hebron is a very popular early potato, prolific, hardy, and of excellent quality for table use, and has been largely adopted. The Peerless, the White Elephant, the Snowflake, the White Star, the Early Ohio, the Burbank Seedling, the Mammoth Pearl, the Chili, the Mount Vernon, the Climax, the Early Vermont, the St. Patrick, and several other varieties are favourably mentioned. But, on the whole, the Roses and the Hebron take the lead.

FROM THE MAY REPORT.

George Russell, Mersea, Essex: Owing to the early frost last fall the corn crop was almost an entire failure; hence the scarcity of seed corn. Some farmers are trying two-years old corn, where they have kept it over; but a great quantity will have to be imported for seed.

Alex. M. Wigle & Son, Gosfield, Essex: We find it advantageous to get seed from the east for a change, peas especially, as they are not eaten by bugs like ours here; but sometimes wild oats and Canada thistle seed are mixed with them. Eastern farmers should be warned against sending foul seeds into this garden of the world.

FROM THE AUGUST REPORT.

Joseph Garner, Pelham, Welland : A small quantity of black Russian barley was sown this year for the first time. It appears to have done well, but as it is not threshed yet I cannot say as to the yield.

George Binnie, Glenelg, Grey : A new kind of oats has been introduced here the last two years, called the Egyptian, which is a good oat and a heavy cropper, but possesses the evil property of staying in the ground. Fields in which it was grown last year seem to be half oats this summer.

FROM THE NOVEMBER REPORT.

Thomas Kells, Artemesia, Grey : It is a well-known fact that many farmers have suffered severe loss by sowing inferior seed on their land the past season. Good seed grain will, no doubt be much sought after. Would it not be well for those who are able to supply such to advertise ?

THRESHING AND MARKETING OF GRAIN.

Threshing operations were much facilitated by the mild, open fall which the Province generally enjoyed. Some farmers, however, preferred to take advantage of the fine weather for their fall work, deferring their threshing meanwhile, especially as nothing was gained by being early on the market The prevailing low prices and sluggish demand, not for wheat alone, but for all grains, rendered marketing extremely backward. "Farmers, where able," remarked a Huron correspondent, "are holding on to their wheat like grim death ;" and this was the burden of the November reports to the Bureau from every county, with scarcely an exception. While the granaries of the country were full to overflowing with the produce of this "fat year," the farmers were still very reluctant to part with it at the prices, and as a rule only offered sufficient to supply immediate needs for money. The general disposition was to hold in expectation of better prices before the return of spring. There was, however, a considerable movement in barley, which, where bright and healthy, was generally regarded as the most saleable of the coarse grains of the year ; several correspondents, indeed, assert that it fetches more per pound than wheat. This movement was promoted by the abundance of peas, oats and corn available for cattle feed. In some instances, where goose wheat is raised, that grain is retained for fattening purposes, and barley marketed. But in localities in which barley is the principal coarse grain grown, the preponderance of opinion is that it pays better to keep it for feed than to sell ; and so great a proportion of the year's barley crop was discoloured, that farmers appeared more generally disposed to go into stall feeding of stock in order to utilize it. In this connection the remarks of two or three correspondents may be quoted. From Dunwich, Elgin : "I believe that nearly all the barley in West Elgin will be fed ; cause, low price, and barley and corn mixed and chopped are unsurpassed for fattening purposes." From McKillop, Huron : "A good deal of barley will be fed, because the price is so low that it is the cheapest feed we have, and the experience of the past shows that the farmers that make the most money sell scarcely any coarse grain." From Yonge Front, Leeds : "I think the greater portion of the barley will be fed on the farm, as farmers here have come to the conclusion that there is more money in feeding for beef and pork, and keeping up the quality of the cattle for dairy purposes, than in selling even at the highest price." From Woodhouse, Norfolk : "Some farmers are buying stock and talking of feeding their wheat and barley." The effect on barley cultivation of the adoption of the Scott Act in so many counties is a frequent subject of comment,—the opinion being in some cases that it will diminish the cultivation of this grain, and in others that it will divert the barley formerly devoted to malting purposes into cattle feeding, for, as one correspondents puts it, "We want less beer and more beef." At any rate, from one cause or another, a considerably larger number of animals than usual appeared likely to be stall-fed on barley during the winter.

FROM THE NOVEMBER REPORT.

George Leak, Rochester, Essex: This season, so far as crops are concerned, has been very favourable to farmers, but the price of wheat being so low a good many feel a little discouraged.

Henry Morand, Sandwich East, Essex: My impression is, that if a change does not occur, enabling us to sell our produce at reasonable prices, a general depression will certainly be the result of such low prices.

John Bishop, Orford, Kent: This has been the best season I ever knew. Crops are good if prices are low, and farmers are clearing off their old debts and incurring very few new ones.

Alex. Clark, Dunwich, Elgin: Owing to last year's scarcity, and this years' low price, prospects for farmers are very poor. Upon the whole they are as well off as the merchants.

James Davidson, Yarmouth, Elgin: The crops have been good, but the farmer will have to economize on account of the low prices for all sorts of farm produce. With those paying high rents the effect is already visible.

Daniel McKillop, Aldborough, Elgin: Prices for farm produce and stock are and have been for some time very low, and it was with considerable difficulty that farmers could be persuaded that they would have to except those low prices in order to effect a sale. They are now convinced that low prices must rule, and produce and stock are moving quite freely. There is a large precentage of young stock, such as store cattle and lambs, being shipped to Buffalo.

C. A. O'Malley, Wardsville, P.O., Elgin and Middlesex: The outlook for the future is very dark. Many heretofore well-to-do farmers and mechanics do not know how to make ends meet. The failure of crops in 1883 brought them up standing, and now they must go the wall. Farms are in the market on all hands.

Duncan Schooley, Bertie, Welland: Taking the whole crop into consideration, it is extra. the yield being large and the sample good; but the prices are so low that the farmers are worse off than they were last year with a small yield and better prices.

William Parker, Stamford, Welland: Everything is dull here, owing to the failure of crops last year and the low prices ruling at present, and they will not improve until the farmers accept the situation and sell their produce, if they can get buyers.

George Cowan, Innisfil, Simcoe: Wheat of all kinds has not been so low in price since I came to Canada, over 28 pears ago. With the short crop here last year and the low price this season it is very hard to make ends meet, especially on rented farms.

William Watcher, Dorchester, Middlesex: I believe large quantities of grain will be held over on account of present low prices, which will cause wheat to be cheap another year, even if crops should partly fail.

Robert Shearer, Niagara, Lincoln: The season closes on a large return of all the staple crops, but the feeling is very dull, prices being so low that there is not a paying return for any. Those who were fortunate enough to be pretty heavy in peaches are the only exceptions.

Frank Wyatt, Louth, Lincoln: The present year has been all a farmer could wish for, so far as good crops are concerned; but the extraordinarily low price of all kinds of farm produce will be greatly felt by all who have rents to pay, or debt of any kind to meet this winter.

Daniel McLaren, Nelson, Halton: The price of wheat in all probability will be lower in time to come, on account of the vast supplies likely to come from Manitoba and the North-West, and from India.

F. C. Sibbald, M.D., Georgina, York: Crops have been generally good; but owing to low prices many farmers will find it difficult to meet their expenses, and be obliged to abridge their outlay on improvements. Consequently many men will be thrown out of employment.

Robert C. Brandon, Brock, Ontario: There are signs of despondency amongst farmers on account of low prices.

William Windatt, Darlington, Durham: There never was a more abundant crop in this part of the country than this season, and it seems there never was less demand. The mills and storehouses are full of grain, and but few care to buy; hence, stagnation.

E. J. Honey, Percy, Northumberland: Farmers are complaining of hard times, crops being rather below the average and prices of all kinds of farm produce low.

Edwin Wensley, Denbigh, Lennox and Addington: Grain all sold to the lumbermen of the neighbourhood. The bulk of the crop is oats, and they find a ready sale here at 40c. per bushel.

T. R. Melville, Augusta and Edwardsburgh: Those interested in the shipping of butter say there is no demand, caused by the extensive use of oleomargarine in foreign markets.

Alex. Thompson, Yonge Front, Leeds: I think it an error four times out of five to hold the produce of the farm too long for higher prices, as we in this township have found to our great loss in times gone by. We have come to the conclusion to sell the products of our factories and dairies at least every two weeks, and I think it would be wise to act on the same principle with other productions of the farm, and sell as soon as ready for market.

James Gay, Huntingdon, Hastings: Times are dull and money is scarce.

John Westlake, Eldon, Victoria: Good crops but low prices will leave the farmer about where he was last year.

D. Patterson, McKellar, Parry Sound: Lumbering is dull this winter, consequently prices are low.

UNDERDRAINAGE.

It is gratifying to note the steady progress which is being made in underdraining in many parts of the Province. Notwithstanding that the low price of farm produce operated somewhat adversely to the carrying on of such improvements, a large extent of drain was laid during the past season, especially in the western parts of Ontario. Kent, Elgin, Waterloo and Huron show the best results in this respect; tile being the material most extensively used in the three first-named counties, while lumber, chiefly hemlock, and stone are employed to a considerable extent in Huron, as it is in the Lake Huron and Georgian Bay counties generally. Underdraining is making very noticeable headway among the better class of farmers all over the western peninsula, and the more westerly of the Lake Ontario group. One correspondent in Wellington county says that fifty per cent. of the farmers who own their land are doing more or less underdraining in his neighbourhood; and another in the county of Dufferin says that four times as much is being done as in previous years. In most of the central or eastern counties of the Province underdraining is not so much practised; in some cases, as it is stated, because the land only requires surface-draining, if any, but in others unfortunately because only a few farmers appreciate its value as an investment. Stone and lumber are the materials almost universally used in the east. In the northern districts of the Province attempts are being made to utilize "the curse of Muskoka—stone," in draining the land, and though only on a small scale, yet with satisfactory results. Some underdraining with plank is also in progress among the farmers of that new country—a condition of things which speaks well for their enterprise, and an example which might well be imitated in older and richer parts of the Province. Among the hindrances to tile-draining in many parts of Ontario, in addition to the prevailing low prices of produce, one not uncommonly complained of is the difficulty of procuring tile within a reasonable distance, though it is one which is evidently lessening every year. In parts of Ontario, as in Halton and York for example, tile has to be teamed distances of from fourteen to twenty-five miles—a condition of things which was hardly to be expected in those counties. The inferior quality of tile, owing to improper burning, is sometimes assigned as a reason why farmers are using wood and stone for drainage purposes; but in some counties the old wooden drains are being replaced by tile, and this material exclusively used in the new drains that are being laid. Scarcity of skilled labour is another drawback frequently complained of. One correspondent writing from Blandford township, Oxford county, says: "Most labourers pretend skill enough for ditching," and so probably they do. But unfortunately whatever they may pretend the number who really *possess* skill enough for proper tile-draining—which is another matter—is not, judging by the reports, very large. Tile-draining machines, which, by the way, some correspondents have confounded with tile-making machines, appear to be coming into pretty general use where underdraining is extensively carried on, and with a few exceptions, and these chiefly where the land is very stony, they are reported to be successful. Rennie's machine is the only one mentioned, except by one correspondent in Middlesex, who says that Henderson's machine is used and is doing good work. A correspondent in the eastern part of the Province complains that he cannot find any advertisement of draining machines in the columns of the leading newspapers, though he is anxious to get information on the subject. A correspondent in the township of Chatham, Kent county, mentions a rather curious indirect effect of the introduction of improved harvesting machinery in these words: "Since the self-binding harvesters have come to the front, open drains had to be covered up; so many have put tile in this fall." As to the general value of underdraining as an

investment on the farm it need hardly be said that there is but one opinion expressed wherever it has been fairly tried, and that is that, though it may not always pay in the first year's crop, it never fails to make ample and early returns.

FROM THE MAY REPORT.

R. C. Taylor, West Tilbury, Essex: Only partly draining the land and letting manure go to waste, instead of putting it on the land, are probably the real causes of the poor wheat here.

John Dickie, South Colchester, Essex: There are three things that the farmers of this district must attend to if they are to be successful cultivators of fall wheat—nay, I might rather say, if they are to be successful cultivators of anything: (1) The bush has been almost all cut down, and the crops are exposed to the cold, cutting winds that blow chiefly from the north-west and south-west. They ought to begin and plant north and south narrow strips of young, rapid-growing trees, such as the Norwegian larch, which is not only a rapid grower, but also furnishes a very valuable and durable lumber for all ordinary purposes. (2) They must underdrain extensively if they mean to succeed in growing either fall or spring grain. (3) In ploughing they must make narrower lands, not more than fifteen feet across—their lands are generally thirty feet or over—and they must plough deeper. Many merely skim the land, making their furrows only three or four inches deep. The farmers got a severe lesson last year by the failure of their staple crops of fall wheat and corn, and have profited by it.

Thomas Plant, Maidstone, Essex: This locality can never be farmed to advantage till it is underdrained. . . . It pays better to grow grass than grain here.

James MacFarlane, Dover East, Kent: We want better drainage, and the denudation of the forests is also causing much injury to the wheat crop. Owing to the levelness of our land, extensive co-operation is necessary to secure effective underdrainage, and such co-operation can be obtained only by judicious and just drainage laws, which would encourage farmers to undertake and carry out such improvements. The making of good drainage in this township is kept back by unsuitableness in the drainage laws and by bungling and unfairness in the interested parties.

Henry Doupe, Usborne, Huron: The partial failure of the fall wheat crop in this part of the country may be attributed to three causes:—(1) The want of draining on flat clay land. (2) Late sowing. Fall wheat ought not to be sown later than the 18th or 20th of September. The best time to sow it is the first week of September. (3) Land being too poor, unfit for wheat, and not properly cultivated. These views are the result of my observations for over thirty years. There is an exception to the above, that is, when solid ice covers the land after a thaw for several days.

Thomas Fraser, Huron, Bruce: The past year and the wet weather of this spring have shown the great need of underdraining, and there has been more done this spring than ever before in one year.

Archibald S. Campbell, Kincardine, Bruce: The prime necessity of this section is underdraining. It is attracting some attention in limited sections, but not nearly the attention it merits. There is a good opening for that class of labourers hereabout. Our Canadian-raised men are not well adapted for this kind of work. They want to do everything by machinery.

John Cameron, Holland, Grey: We have had a tremendous time with rain the last ten days or so. Drainage is something that has been negleeted in this county, and we can see the loss we sustain by that neglect, this spring particularly.

C. A. O'Malley, Wardsville, Middlesex: Generally, land never was known to be in better order, or seeding and planting better done.

Wm. Stewart, West Zorra, Oxford: I think the leading cause of failure in fall wheat was the lateness of sowing. I have not seen any wheat put in well prepared, dry, or well-drained soil that failed.

John Gibson, Markham, York: This season has been favourable for land not underdrained so far; but if continued wet weather were to set in now the well-drained land would at once show the great advantages of underdraining.

FROM THE AUGUST REPORT.

Robert Watson, Windham, Norfolk: We would do a good deal more tile draining here if we could only get the help.

J. B. Hobbs, Warwick, Lambton: The land last fall was dry and hard; much of the wheat got in in poor condition, and the crop on such ill-prepared soil was not in condition to stand hard spring frosts. But where all was favourable on well drained land it will yield from thirty to forty bushels an acre.

Robert McCutcheon, Sydenham, Grey: Every year makes it more evident that farmers will have to give more attention to farming to make it pay, and underdraining is one of the most important parts of good farming.

Hon. J. Simpson, Darlington, Durham: I have 80,000 feet of tile underdrainage on my farm—100 acres—and I wish I had more.

FROM THE NOVEMBER REPORT.

John Dickie, Orford, Kent: The more intelligent of the farmers are quite alive to the immense advantages of underdraining, and I feel confident that it will go on increasing annually.

T. L. Pardo, Raleigh, Kent: We are far behind here in tile-draining, yet some of our best farmers are underdraining their lands, which will induce others to follow their example. Scarcity of tile is one great cause of delay; only one tile-draining machine in this township.

J. H. Houser, Canboro', Haldimand: The farmers in this locality must give more attention to underdraining.

Edwin Gaunt, West Wawanosh, Huron: In draining, hemlock lumber is used in this locality instead of tiles, the former being cheap and plenty, but would prefer tiles if they could be had. I am sorry to see some of our best lands practically valueless, and producing nothing for the want of a few underdrains. A well-drained farm is the exception rather than the rule, which should soon be reversed, as nothing returns high interest on the investment sooner than systematic draining

Thomas Welsh, Huron, Bruce: One of our greatest wants here is skilled labour for tile drainage.

Wm. Milne, Osprey, Grey: There is no tile here. Farmers are not alive to the great advantage of draining. We have plenty of suitable stone. I believe the use of foreign manures would have a marvellous effect here in starting the crops earlier in spring.

F. Malcolm, Blandford, Oxford: In my opinion far too little attention is paid to scientific underdrainage. How many ditchers can grade the bottom of a drain? Very few; yet this is the most important part.

Thomas Baird, Blandford, Oxford: I would like to know a little more about the tile-draining machines—where made, cost, and at what rate they can dig by the rod, as men's labour is costly and it is not every man who can and will do that kind of work.

A. M. Driver, Blairshaw, Perth: There is more than the usual amount of large water-courses being opened on account of parties availing themselves of the Ontario Statute *re* Engineer.

L. Parkinson, Eramosa, Wellington: The high rate of wages and lack of sufficient skilled labourers prevent the farmers from going into draining extensively.

Robert Hayward, Arthur, Wellington: Very great disadvantage in draining on account of no tile being manufactured here.

David Spence, Amaranth, Dufferin: I have underdrained a good deal this last thirty years and have used up all the stones I could get. I have commenced with cedar poles, and find they do very well when nothing better can be had. I filled 115 rods with cedar poles and splint pieces this year. I know a cedar drain filled over twenty-five years and it is good yet. No tile can be had here.

Dr. Elkington, Palmerston and Canonto, Frontenac: No underdraining; we are on the Laurentian formation. A few of us are draining our heavier meadows, which for some years require wide, deep open drains, or rather water-courses.

John S. Hart, Drummond, etc., Lanark: Very little underdraining has been done in this locality—only isolated instances by enterprising farmers—but always with satisfactory results.

Edmund Anderson, Lanark, Lanark: Underdraining here is generally done by laying two poles about six inches apart and covering with stone.

James Findlay, Westmeath, Renfrew: Very little underdraining done at all. No tiles. Where can they be bought, and cost? "Any tile-draining machines?" No, no, sorrowfully no!

John Hollingworth, Watts, Muskoka: I do not know of anyone but myself who has made any attempt at underdraining. Last fall I put in some seventy rods of rubble drain, and so favourable has been the result that for the future I shall bend all my energies to do all I can in underdraining. When we get sense enough to utilize the curse of Muskoka—stone—in the working of roads, fences, buildings and underdrains, then indeed will that curse prove an unlimited blessing.

FALL PLOUGHING.

With but limited exceptions the weather last fall was very favourable for fall ploughing, and farmers generally took advantage of that circumstance, in many cases deferring their usual fall threshing until the ground was frozen so as to keep the ploughs busy. As a result there was probably, taking the Province as a whole, a considerably larger area of fall ploughing done than usual. In some of the Lake Erie counties, however, comparatively little progress had been made at the date of the November report, partly owing to the farmers being still busy with their corn; partly because the land in most of these counties was hard and dry; and also because, as one correspondent asserts, in light sandy or gravelly soils farmers do not think that fall ploughing is an advantage to the land. In the eastern part of the Province there were some complaints that the land was too dry, though as a rule it was in even more favourable condition there than the west, owing to occasional showers. In some of the lower lying districts of the St. Lawrence and Ottawa group rather too much rain had fallen for satisfactory progress, but as a whole the reports were very favourable.

GENERAL REMARKS.

The following extracts are taken from the General Remarks of correspondents :

THE WEATHER.

FROM THE MAY REPORT.

C. Coatsworth, Romney, Kent : Our climate here on Lake Erie is somewhat different in the spring and fall from other places in western Ontario. Cold, chilly winds off the lake in spring keep back vegetation, which is a benefit to fruit trees and crops. Then in the fall we are free from frosts usually until about the 20th of October.

Henry Duncan, York township, York : We have had a very favourable season for spring work, and grass and grain look hardy, which perhaps is better than a rapid growth this early in the season.

J. E. Gould, East Whitby, Ontario : On the whole the weather has been delightful. Seeding was completed much sooner than farmers expected.

FROM THE AUGUST REPORT.

T. F. Kane, Middlesex, Essex : Pastures were dried to the consistency of brick dust, but the recent rains are refreshing them.

James Cruickshank, Zone, Kent : The finest summer I ever saw—cool all July.

Ira Barber, Townsend, Norfolk : Fall wheat in some localities was badly damaged by hail ; in others slightly by frosts. It was badly knocked down by wind and rain where stout and rank.

Thomas Wilson, Huron, Bruce : No rain here since the 25th of May until the morning of the 31st ultimo —not more at least than would wet a muslin handkerchief. Then we had a pour for over an hour.

James Johnston, Carrick, Bruce : This has been the driest June and July I ever saw ; in fact, I have seen more rain fall in one hour than we have had for the last two months.

Peter Bertram, Orillia, Simcoe : My report is subject to an exception of a few localities where they seem to have missed nearly all the summer showers, which have been mostly thunder storms. There is a belt passing through Orillia that has had constant showers, and in this belt the crops are all good.

William Whitelaw, Guelph, Wellington : This has been a very peculiar season ; some farms and sections suffering very much from want of rain, while some just adjoining have had almost sufficient, the showers being local and partial.

A. H. Pettit, Grimsby, Lincoln : We have had this 31st July the heaviest rain of the season—just two and one-half hours one continual downpour. The ground in this locality is thoroughly saturated.

John Secord, Grantham, Lincoln : The year 1884 so far has been about as good a growing season in this section as we have had for many a year.

Thomas McDowell, South Gower, Grenville : I have not seen a hail storm this summer. Corn and tall thick grain are standing perfectly erect.

W. J. Lummerby, Russell, Russell : Yesterday we had the heaviest rain of the season, and where the grain is rank it is very much beaten down.

Joseph Alton, Strong, Parry Sound : We had a white frost last night on the low lands.

FROM THE NOVEMBER REPORT.

Edward Nash, Mersea, Essex : We have had a splendid fall so far.

W. McKenzie Ross, Harwich, Kent : The weather so far has been very fine, and if work is behind it is on account of sluggishness. With a boy I dug a drain 1,000 feet long and two and one-half feet deep, and laid in the tile in three days, all complete.

George Green, Chatham, Kent : The past season, from early spring till now, has been the finest for outdoor work of every kind that I have known during the twenty-seven years that I have been here. Every thing was well taken care of and got in in good condition, and the fall work is more forward than usual.

Dugald Campbell, Dunwich, Elgin : The past season has been one of the most pleasant for farm work that I have seen for a number of years.

James McClive, Bertie, Welland : In all my experience as a farmer I never before saw such a year as this ; every crop was good and fairly well stored ; a most bountiful season throughout.

A. Drummond, Howick, Huron : Crops of all kinds suffered severely in this part from drought, consequently they are light. Cattle feed will be scarce. Many are selling the cattle they intended to feed. The greater part of the roots were ploughed up and fall wheat sown.

Capt. John McIntyre, Elderslie, Bruce : This has been the dryest season I have seen in this country for twenty years. No rain worth mentioning from the end of April to about the 20th September.

Thomas Fraser, Huron, Bruce : The middle of seeding of the first three weeks of May were very wet and some grain was drowned. It then came in dry and was the longest drought we ever had, continuing to the 20th of September, some having to draw water for stock up to the 20th of October, which accounts for poor pasture and thin stock.

John Jackson, Caistor, Lincoln : This has been one of the finest seasons, taking all things into account—grass, grain crops, root crops, pastures, etc.—that I ever remember seeing.

THE HARVEST.

FROM THE AUGUST REPORT.

Edward Nash, Mersea, Essex: There are some oats that will turn out seventy-five bushels to the acre, but that is an exception.

John Anderson, Turnberry, Huron: I would recommend early sowing of fall wheat. In sowing last fall I missed a land and sowed it about ten days later. Though when we came to harvest it there was twenty bushels an acre on each side of it. This land was hardly worth cutting.

Albert Gilbert, Woodhouse, Norfolk: Farmers find that sowing salt on the crop (fall wheat) has a tendency to prevent the rust.

H. T. Potts, Saugeen, Bruce: I have seen fields of fall wheat which will go thirty bushels per acre, and others which will not go five.

T. Abercrombie, Euphrasia, Grey: In this township there is a difference of ten days in harvest, on account of high and low land.

George Binnie, Glenelg, Grey: Hay ranges in this township all the way from very good to very bad—from two tons per acre to two hundred pounds. The very good means first or second crop with manure and good cultivation; the very bad, third or fourth crop with poor cultivation.

James Farney, Flos, Simcoe: Many fields of fall wheat far above the average—I should say forty-five bushels per acre, with very plump and bright grain.

H. R. Archer, Mosa, Middlesex: On some farms fall wheat and oats have been as high as fifty bushels per acre.

Richard Joliffe, North Dorchester, Middlesex: I have some barley will yield forty-five to fifty bushels to the acre, and of good quality; average, thirty.

A. M. Driver, Blanshard, Perth: There are several fields of fall wheat in this neighbourhood will thrash out forty bushels to the acre. The average is lessened by fields partially winter-killed. There are also fields of oats that will yield fifty bushels. Fields worn out by over-cropping reduce the average.

W. Brown, Guelph, Wellington: Spring wheat promises particularly well. Many fields I have examined will thrash thirty bushels per acre, of the white Russian variety. It has filled well during the recent cool weather.

A. G. Muir, Grimsby, Lincoln: In fall wheat I think that last year I reported an average of six bushels per acre, and was thirty per cent. too high, while this year I report twenty-six per acre, and I believe I am low.

R. Postans, Trafalgar, Halton: The yield of fall wheat will be heavy; I have heard forty bushels per acre mentioned.

Wilhelm P. Plotz, Clarendon and Miller, Frontenac: This part of the country is in a backward condition. The greater number of settlers depend on working in the lumber shanties, and selling the hay off their farms. The result is that their farms are not worked properly, and by selling their hay every year they impoverish the land. Whereas the smaller number of settlers devote all their time and attention to their farms, and they are comfortable.

A. F. Stewart, Beckwith, Lanark: It is very hard to give a correct estimate for this year, one part of the land being a light crop and the other heavy. The dry weather lasted twice as long in one half of the township as in the other.

FROM THE NOVEMBER REPORT.

Thomas Brown, North Cayuga, Haldimand: Upon the whole, with the exception of fruit, this has been the best year for the farmer for a number of years; but prices of all kinds of grain are very low, and nearly everything is in comparison.

G. E. Cresswell, Tuckersmith, Huron: The quality of the fall wheat is so fine this year that I have increased my estimate very materially. Wheat weighs like lead. A general surprise is manifested at the results of threshing. Perhaps the most noticeable feature of the year's operations is the apparently complete destruction of the pea bug. Various reasons are assigned, but the most general opinion seems to be that the excessive wet of last season has been the cause, by destroying the young bug in its first stages.

Wm. Elliott, East Williams, Middlesex: The township at large has produced this year a greater abundance and better quality of cereals, roots and vegetables than any year in my recollection, as shown by our agricultural show at Parkhill.

E. Hodges, Whitby East, Ontario: I think farmers in this section need not complain; almost every kind of grain and roots are a good crop, and although prices are low I think we will come out about as well as in former years.

G. Kinsey, Uxbridge, Ontario: We have abundance of everything, and have had good weather for securing crops.

INSECT PESTS.

FROM THE AUGUST REPORT.

A. M. Wigle & Son, Gosfield, Essex: There is a black grub which has quite destroyed our corn this spring, so that we are now planting all over the third time. Is there any preventative, or remedy?

R. C. Taylor, Tilbury West, Essex: My little boy found worms in the fall wheat grains. I think they are like what we had in Wentworth county twenty-six or twenty-seven years ago. We called them weevil then. A neighbour from Stony Point was here to-day. He says the midge has been in the clover here for many years, and is in the early crop, but does no perceptible harm. He says it was here at the same time as the wheat midge—fifteen or twenty years ago—but he does not think it is identical with that insect.

James Davidson, Yarmouth, Elgin: After the frost an insect formed its web in the apple blossoms and drew the bunches of blossoms together, and seemed to destroy the apple before it got fairly started.

Samuel Yeandle, Southwold, Elgin: The wheat crop, or part of it—the Egyptain variety—almost destroyed by the midge. Fully two-thirds gone.

Isaac Piett, Houghton, Norfolk: There is some kind of pest, resembling a cat-fish in form—black and slimy, and about half an inch long—working on the under side of the leaves of the cherry trees.

John Darby, Vespra, Simcoe: A joint worm in the timothy, which cuts the straw in two at the first joint below the head, thereby destroying the seed, is much more prevalent this season.

J. E. Gould, East Whitby, Ontario: I have noticed one or two pieces of clover that are being saved in this locality, where it was pastured until the first or second week in June. The prospects are a good crop of seed, with no effect to be seen of the midge.

FROM THE NOVEMBER REPORT.

Isaac Piett, Houghton, Norfolk: The crops were destroyed by a worm resembling the currant worm, having a web like an apple caterpillar.

D. S. Robertson, Plympton, Lambton: In the former part of the season I remarked that the damage done to clover by the midge was inappreciable, but in this I was much mistaken, for shortly afterwards I examined a few heads in my own field and found them literally crawling with midge. I found other fields to be in a similar state.

Henry Doupe, Blanshard and Usborne, Huron and Perth: I have paid some attention to the clover fly this past summer, with regard to its development. The fly is about one-fourth of an inch in length when full grown. It consists of three parts, the head, thorax and abdomen. It has six legs, and two wings folded over each other across the back, of a white appearance. Its colour is jet black. It lays its eggs—from two to four in number—in the calyx of the clover pedicel before it blooms. They are an orange color, and so small that they can scarcely be seen with the naked eye. They are round in shape. After a few days they grow long and signs of life may be seen in them. After this the head and hinder part turn black; then the legs begin to appear and the whole body becomes black. Lastly, the wings appear and the fly is perfect.

Walter Riddell, Hamilton, Northumberland: I have heard some complaints of the leaves of turnips being eaten off by a worm - some say the army worm.

Thomas Telford, Ennismore, Peterborough: The turnip worm has not done much harm to our crop, it appeared at first like a dark speck beneath the blade, and continued to grow of a pale green colour without spots, but never came to a butterfly that I could see. The tops were destroyed, and the turnips never grew after being attacked.

MISCELLANEOUS.

FROM THE MAY REPORT.

C. Coatsworth, Romney, Kent: Our climate here on Lake Erie is somewhat different in the spring and fall from other places in western Ontario. Cold, chilly winds off the lake in spring keep back vegetation, which is a benefit to fruit trees and crops. Then in the fall we are free from frosts usually until about the 20th of October.

David Caughell, Harwich, Kent: In this township beans are raised to a large extent—I might include the county. Many farmers will plant from twenty to forty acres. Average crop per acre, 20 to 25 bushels; prices per bushel, $1 to $2. In Harwich farmers will plant an average of eight to ten acres.

G. R. Langford, Camden, Kent: The farmers are imposed upon by the telephone and telegraph men, who come along and cut down and destroy our fruit and other trees planted by the roadside. I would suggest that they put the poles on the road side of the ditches.

Jabel Robinson, Southwold, Elgin: Every effort should be made to make the money invested in farms pay interest equal to that charged by the banks. It can only be done by practising the best system of farming, studying economy, and by purchasing in bulk and at first cost.

Silas Mills, Moore, Lambton: More shade trees are being planted out, chiefly maple; and a great amount of drainage is being done in the township, both by the council and by private parties.

John Darby, Vespra, Simcoe: Quite a new thing which has appeared here lately is cockle in spring wheat; we had not noticed any of it until last season.

Thomas S. McLeod, Oro, Simcoe: Wild oats spreading to an alarming extent.

F. Malcolm, Blandford, Oxford: Many farmers in this county are asking, Of what are we going to make our fences? I suppose the same question is asked in all the older counties of the Province. Has anyone practically succeeded in preserving posts?

W. Sutherland, Glencoe, Middlesex: I have kept a record of the time of blossoming of the wild plum for the past 14 years, varying from April 27th in 1871 to May 19th in 1873. I find the average to be May 10th, the day on which it blossomed this year.

T. A. Walker, Ancaster, Wentworth: The opinion here is that salt is a first-class article for all kinds of crops. It is taking the place of other fertilizers.

J. T. Evans, Etobicoke, York: The farmers lost heavily last year through the inability of storekeepers to sell Paris Green for the potato bugs. We had to go nine miles for our supply. That stupid law is wholly in the interest of the chemists.

D. Kavanagh, Dungannon and Faraday, Hastings: The land here is free grant, and the country is settling up very fast, owing to the construction of the Ontario Central Railway, and the large quantity of iron that has been found in Dungannon and Faraday. There are specimens of iron on nearly every lot.

George B. Meredith, Franklin, Muskoka: Eight years ago this part was not inhabited except by the trapper. At present some of the settlers are in comfortable circumstances and have large clearings.

Michael Ruttan, Ryde, Muskoka: As lumbering ceases farmers turn their attention to their farms here. A few broken lots could be obtained by farm labourers, who could locate and make homes for themselves, and at the same time earn their living amongst the farmers in this township.

W. H. Green, Sinclair, Muskoka: There is great need of a standard market here in the fall of the year, as the people are all poor and want to make quick returns.

F. W. Ashdown, Humphrey, Parry Sound: This part of the country is kept back for the want of railways to make a market for surplus grain, hay, timber, etc. The want of a grist mill in this township is the greatest reason why not much wheat is grown, as the nearest mill is 22 miles distant.

FROM THE AUGUST REPORT.

Jabel Robinson, Southwold, Elgin: The garden, that most important auxiliary to the farm, is not taken into consideration in your reports. Every farm should have a garden of at least one-half an acre in connection. A good supply of all kinds of vegetables is equalled only by a good supply of fruits.

Alexander Clark, Dunwich, Elgin: The failure of crops last season left farmers pinched, consequently few improvements go on.

B. B. Smart, Sarnia, Lambton: I had two acres of mangolds just coming up, when the frost of 29th May cut half of them down. Two rows of cabbages were killed, but the ten rows of carrots stood best of all. I had enough mangolds to transplant the bare spots, and the leaves now cover all the ground. Rows, 28 inches apart.

Stephen Hall, Blenheim, Oxford: Not many sheep are raised on account of the low price of wool.

F. Malcolm, Blandford, Oxford: On heavy soil there is considerable complaint regarding turnips not coming forward after coming up. The reason I think is attributable to the June drought. The ground was very loose and mellow, and when drills were made it did not pack enough for the tender roots to get sufficient hold. Splendid on light soils.

J. A. Brenton, Burford, Brant: Woodchucks are very destructive in some parts of the township. Something should be done towards destroying them.

F. C. Sibbald, Georgina, York: Many hands are returning to their old homes from Michigan and Manitoba.

Wilhelm C. P. Plotz, Clarendon and Miller, Frontenac: I have read the statistics with pleasure, and I think that pamphlets printed in the German and English languages and sent over to Germany and Scotland would induce the right class of people to come here. In my twenty years' observation these two nationalities are the most frugal, industrious and persevering people to work the wilderness into arable land. I believe some copies of the agricultural statistics would do more to develop the Province than all the emigration agents combined.

Edmund Anderson, Lanark, Lanark: Bees have not done well as yet this season. The cold spells of weather have kept them back by injuring the bloom, but if frost keeps off there may yet be a good flow of autumn honey.

FROM THE NOVEMBER REPORT.

James Macfarlane, Raleigh, Kent: Our farmers fail to organize and maintain well-managed farmers' clubs.

John Dickie, Orford, Kent: A considerable portion of this township consists of light sandy or gravelly soil, which farmers do not think is benefited by fall ploughing. They are perfectly right in that.

G. R. Langford, Camden, Kent: Fencing against all stock is very expensive with the present mode of fencing. We require a cheaper mode, then every farmer will fence against the stock that is left to run the woods, etc.

J. H. Houser, Canborough, Haldimand: The farmers in this neighbourhood have gone considerably into tree-planting along the highways and line fences, and are improving their buildings.

John McCauley, Elma, Perth: Plough in the fall deep; plough again shallow in the spring, and you will have no thistles.

Daniel McLaren, Nelson, Halton: The barley industry is likely to succeed in inverse ratio to the success of the Scott Act agitation.

Thomas Brown, Markham, York: The east riding of York gives prizes for roots in the field. The judges go to the field, pull up and weigh a portion, and estimate the weight per acre. This year mangolds went over 59 tons per acre, and carrots 39 tons.

E. J. Honey, Percy, Northumberland: Considerable improvements have been made in building this summer stone walls under barns, etc.

Dr. Elkington, Palmerston and Canonto, Frontenac: No fall wheat sown; only seven acres in the whole municipality. So long as the bush shelter remained and clearances were small, the grain was most successfully raised here. It fails now.

A. D. Aird, Kenyon, Glengarry: There is a settlement of French-Canadians a little to the north of us who raise a great deal of peas for soup and market, and some days as many as 100 teams were seen passing to Maxville station.

Charles R. Stewart, Dysart, Haliburton: The whole district is fairly prosperous, but it is due, not to farming, but to the forest crop—lumbering and taking out ties, fuel, poles and so forth.

James Early, Chaffey, Muskoka: Our prospects are brightening; the railway is booming along very fast.

Frederick N. Toye, Draper, Muskoka: There has been quite a lot of lumbering done in this locality for some years past, and the farmers have given their attention principally to raising supplies for the lumbermen, such as hay, oats, potatoes, etc.

W. D. White, Medora, Muskoka: This part of the country is rather behind yet in everything but roots. We are, however, improving, and getting thoroughbred bulls to improve our stock. The shorthorn Durham takes the lead.

George B. Meredith, Franklin, Muskoka: It is expected that when the railroad from Gravenhurst to Calendar is finished it will be a great advantage to this part of the district, as we shall then be able to get our surplus grain to market.

The following was received after the publication of the November report:

Walter Hick, Goderich, Huron: I see by the November report of the Bureau that the absence of the pea bug this year is attributed by several correspondents to the wet season of the previous year. That wet season did not seem to affect the potatoe bugs, but let us hope that this dry season has given them their quietus. They were pretty numerous in the beginning of summer, but the dry season caused a premature ripeness of the potatoes, so that we did not get a second brood of the pest. I had a new sort of potatoes that withstood the drought well and kept green till late. There were a good many of the young beetles on the product of the first brood, but not a single larva was to be seen; and, in my opinion, it is the late ones that burrow in the ground and form in the pupa state, then the beetles come and hybernate until spring, when they again begin their work of destruction. If this is so, it will be a blessing. Next spring will tell the tale.

PART II.

FRUIT AND FRUIT TREES.

STATISTICS OF FRUIT GROWING.

Fruit-growing appears to be gradually developing into one of the staple agricultural industries of Ontario. As the capabilities of the Province in this respect become better known, and as regular and improved methods of farming become of more general application, a disposition arises naturally among farmers to devote a larger proportion of their land to this delightful occupation. But a more practical and efficient cause of the increasing attention given to fruit culture is probably to be found in the rapid expansion of our export trade in fruit, particularly apples. Ontario apples now hold the supreme place and command the highest prices in the English market; and our people are gradually learning that, with the specially favourable conditions for fruit growing by which they are surrounded, it can be made not only one of the most pleasant, but also one of the most profitable branches of agricultural industry in this Province.

According to the census returns, Ontario's total product of apples increased from 5,486,504 bushels in 1871 to 11,400,517 bushels in 1881; the total product of grapes from 1,028,431 lbs. in 1871, to 3,697,555 lbs. in 1881; and the total product of other fruits from 242,878 bushels in 1871 to 644,707 bushels in 1881. These figures, although of course only approximations, are sufficient to show that an enormous expansion of the fruit industry has taken place.

The following tables, compiled also from the census returns, showing the acreage of orchard and garden in the various groups of counties at the periods named, will give an idea of the development of fruit-culture in the Province during the last three decades:

	1881			1871			1861			1851		
	Rural.	Urban.	Total.	Rural.	Urban.	Total.	Rural.	Urban.	Total.	Rural.	Urban.	Total.
Lake Erie	53,338	3,486	56,824	38,068	1,060	39,128	18,537	177	18,714	10,964	41	11,005
Lake Huron	29,418	3,049	32,467	18,697	514	19,211	3,589	....	3,589	988	....	988
Georgian Bay	18,839	1,629	20,468	10,253	446	10,699	1,666	9	1,675	733	....	733
West Midland	57,632	4,890	62,522	43,859	2,154	46,013	19,478	265	19,743	10,909	82	10,991
Lake Ontario	76,177	5,505	81,682	55,683	2,524	58,207	28,452	372	28,824	20,981	73	21,054
St. Lawrence and Ottawa	28,788	1,423	30,211	20,568	855	21,423	8,388	69	8,457	7,731	58	7,789
East Midland	15,383	1,045	16,428	10,409	438	10,847	7,832	15	7,847	2,704	6	2,710
Northern Districts	1,966	17	1,983	159	....	159	16	....	16	....	....	....
Cities	....	2,220	2,220	....	1,324	1,324	....	2	2	....	191	191
Totals	281,541	23,264	304,805	197,696	9,315	207,011	87,958	909	88,867	55,010	451	55,461

According to the returns of township assessors, the acreage under orchard and garden in the same county groups for the years 1883 and 1884 was as follows:

	1884.	1883.
Lake Erie	acres, 39,952	acres, 40,084
Lake Huron	19,952	19,907
Georgian Bay	11,577	12,228
West Midland	41,628	42,800
Lake Ontario	55,112	57,358
St. Lawrence and Ottawa	14,320	14,760
East Midland	9,780	9,950
Northern Districts	516	363
Totals	192,837	197,450

Between these totals and those of the census returns for rural districts, it will be observed, there is a very large discrepancy; the assessors' returns also indicate a considerable

apparent diminution in the area in 1884 as compared with the previous year. In regard to this latter circumstance, a remark in the report of the Bureau for last May may be quoted: "The reduced area of orchard and garden is no doubt owing to the difficulty of obtaining uniform acreages from farmers in successive years, and this difficulty is increased where the aggregate is made up of a large number of parts. There are not many farmers who know the exact area of land they have in orchard or garden, and a difference of one-half or even one-quarter of an acre more or less in one year than another may make a decided change in the whole quantity. It very rarely occurs, indeed, that in the oldest and best settled townships the area of assessed land is the same one year after another, as recorded on the assessment rolls." It is not improbable, moreover, that many farmers, on realizing that these returns are expected from them regularly year after year, are making actual measurements where they formerly contented themselves with loose approximate estimates, or perhaps mere guesses.

THF FRUIT CROP OF 1884.

The past season has been, on the whole, a fairly successful one for fruit and fruit trees. The opening of spring found vegetation generally in a flourishing condition. Although the winter was severe, the deep snows protected the roots, and orchards survived comparatively uninjured. Many peach trees, however, were destroyed by frost, and considerable numbers of young trees were girdled by field mice. At blossoming time the orchards made an unusually luxuriant display of foliage and blooms, and held forth the promise of an immense yield. But just at the critical period, on the nights of the 28th and 29th of May, severe frosts swept over the whole Province, leaving the former bright prospect much impaired. But for this unlooked-for visitation there is little doubt that one of the most bountiful fruit crops for many years would have compensated for the dismal failure of the previous season.

Our standard fruit, the apple, was not so seriously affected by the frosts as at first supposed; they appeared, however, to check the development of the fruit to a considerable extent. The codling worm was rather prevalent, and many apples were destroyed by it. A greater source of complaint was wind storms, which shook from the trees large quantities of apples before they were ripe, and so rendered them unsaleable. Still the crop as gathered in the fall showed an enormous surplus in the country, which with an active demand, and the prices of other years, would have gone far to compensate fruit-growers for their losses in other directions. Unfortunately, however, the opposite conditions of a stagnant market and low prices prevailed; in many sections of the Province apples of excellent quality were sold at from $1 to $1.50 a barrel, and even at these prices their movement was slow.

Most other fruits have yielded far less abundantly. Pears have been deficient, except in the Niagara peninsula, in Oxford and Middlesex, and in favoured localities in the immediate vicinity of the lakes. Peaches have been a general failure, only a few orchards in the neighbourhood of Niagara and along the shores of Lake Erie having given anything like satisfactory returns. Many pear and peach trees were found to be blighted, and failed to bear; but before the return of winter they began to show signs of recovery.

The yield of plums and cherries was decidedly inferior. Black knot appears to be carrying on a war of extermination against the trees of both, especially in the western districts. The St. Lawrence and Ottawa counties appear as yet to enjoy comparative freedom from this disease, and they give the only fairly hopeful report of the plum crop that comes from anywhere. The Lake Huron and Georgian Bay peninsula, a few years ago an excellent plum region, seems now to be losing its plum orchards,—the trees dying bp wholesale from the combined effects of black-knot, the severe winter, and the blight of 1883. Cherries have succeeded better than plums, and throughout western Ontario the yield was fair; they are a very exceptional and unimportant crop in the east.

The May frosts attacked grape vines extensively, and shortened and retarded the

crop, but the vines suffered no permanent injury, and continued to make a fine growth of wood. In quite a number of instances the second bud developed after the frosts had destroyed the first.

The season's product of small fruits of all kinds, especially of raspberries and currants, has everywhere been great. The only small fruit at all injured by the frost was the strawberry, a good many blossoms having been destroyed; but the crop on the whole was a good one. Wild fruits have yielded immensely, raspberries in particular. From Essex comes a complaint of the currant worm among red currants and raspberries.

Insect annoyances appear to have been less prevalent than usual, and the orchards met the approach of winter in a healthy condition, the trees having made a good growth of well-ripened wood during the season.

The Lake Erie counties have made rather a poor fruit record for the year. At the date of the May report the outlook was very bright; apple and pear trees, grape vines, currant and raspberry bushes, were all strong and healthy, and made an unusually prolific display of fruit buds. But the frosts at the close of the month almost totally stripped the orchards of their blossoms. The consequence has been a great deficiency of all large fruits, except perhaps apples, which though extremely scarce in isolated localities have been in fair enough supply throughout the district as a whole to meet the home demand and to furnish a respectable surplus for export. Occasionally in the immediate vicinity of the Lake shore, where the frost was not so severely felt as in the interior, the yield was abundant. A Kent correspondent says there have been about 5,000 barrels of apples shipped from the southern portions of the townships of Raleigh and Harwich; and one in Gosfield (Essex) reported a large surplus of apples wasting for want of a market in his neighbourhood. Small fruit, such as strawberries, raspberries and currants, were in good supply. In addition to the frost, there has been the usual number of local and exceptional misfortunes. Storms and winds in Norfolk, Haldimand and Welland caused considerable quantities of apples to fall before they were ripe; in some localities they were spotted and wormy; and from Bertie township, in Welland, come accounts of destruction by the codling moth and by heavy rains in June. Peach trees appear to have been the greatest sufferers from the frost, but they are slowly recovering. The frost made the grape crop light and late; but the vines were not seriously affected. Plum and cherry trees continue to be much afflicted with black-knot. Apple and pear trees, however, are fairly healthy, and have made a thrifty growth of wood for next season. A few young trees were girdled by mice last winter.

Apples were abundant and cheap throughout the Lake Huron and Georgian Bay districts, and there was an immense exportation in the fall, especially from the county of Huron. In the neighbourhood of Seaforth large quantities of fall apples have been shipped to Manitoba, and of winter varieties to England. A Goderich correspondent estimates the total product available for export at 40,000 barrels. Apples of good quality have sold at from $1 to $1.50 a barrel. The quality of the crop has generally been good, the fruit being large and fine, except that grown on light soils, which is undersized. Considerable quantities, too, have been injured by the codling worm, which appears to have been widely prevalent, though, in the opinion of some correspondents, not to such an extent as in former years. A Brant township correspondent declares that it has destroyed fully half the crop in his neighbourhood, by causing the apples to fall before they were ripe. Mr. A. McD. Allan, of Goderich, recommends spraying the trees with a weak solution of Paris green and water just when the apples are formed, which, he says, has proved a successful remedy, as it destroys the moth without injuring the fruit. Many trees which were unprotected by wind-breaks similarly lost much of their fruit by storms. Other large fruits have been a failure, especially peaches, which are an extremely uncertain crop in these counties; the only hope of a regular supply of this fruit appears to be from early seedlings. Many peach trees, as well as pears, are dying from blight. There was, however, a sufficiency of pears for home consumption. The usually splendid plum region of Huron, Bruce and Grey yielded a very scanty crop of plums last season. At the very opening of spring, as noted in the May report of the Bureau, the aspect of the trees was such as to foredoom the crop to failure. Throughout this whole section, the report stated, the plum orchards had "met with some dire calamity, which has left thousands of trees dead to the roots, in not a few instances whole orchards have been destroyed. One correspondent in Grey mentions a case in which a single orchard has lost a thousand trees since last season, all of which have been chopped down. The disaster is not an effect of the past winter, which was generally favourable to fruit. It is variously attributed to black-knot, to exhaustion from previous overbearing, to last year's blight, and to frosts of last fall and this spring. A Bruce correspondent suggests this theory for it: 'Warm weather in the latter part of March started the sap of plum and peach trees too soon, so that the cold weather in April, going down sometimes to 7° above zero, blighted and killed many trees.'" Later opinions are inclined to attribute the weight of the destruction to the combined attacks of black-knot and the curculio. The only remedy appears to be to cut down the trees and abandon the cultivation of plums for some years, and then begin afresh. Nor are cherry trees quite exempt from the same disease, and the crop was small. Apple orchards are thriving, and have acquired a good addition of healthy wood for next season. Grapes have been fairly successful, and all small fruits have yielded abundantly.

The severity of last winter and the frosts of last May told rather heavily on the orchards of the West Midland counties. Old apple orchards especially suffered greatly, many trees dying, while plum and cherry trees are succumbing everywhere to the combined onslaughts of frost and black-knot. Young apple and pear orchards are in fair condition, and show a good growth of new wood. Except in apples, the season's fruit product has been rather small. Peaches have been unusually scarce everywhere. Oxford and Middlesex only have a sufficiency of pears, the latter yielding a small surplus. Plums, cherries and grapes have all been insignificant crops; grape vines were badly nipped by the May frosts. The large surplus of apples has, however, to a great extent, compensated for the deficiency of other fruits. The May frosts were

not so destructive of fruit germs as at the time supposed ; the principal drawback of the year has been wind storms, which shook large quantities of apples from the trees before picking-time, rendering them unfit for shipping. Every county has produced sufficient for home consumption, and all except Dufferin report a large surplus. But the general abundance turns out to be only a partial blessing to the growers, owing to the extremely low prices that prevail and the comparative absence of demand. A Blanshard (Perth) correspondent in November stated : "Some farmers are feeding their apples to their cows, thinking that it does not pay to take them to market at the present prices." A similar condition of things was reported from other counties. "Good winter-apples," remarked a Biddulph (Middlesex) correspondent, "such as Northern Spies and Rhode Island Greenings, can be purchased for a dollar a barrel ; " and in some localities in Waterloo apples of fair quality were said to have been offered at prices as low as from twenty-five to fifty cents a bag. Still, buyers bought up considerable quantities for shipment to the English market.

The orchards of the Lake Ontario counties are in a fairly healthy condition ; apple trees especially have made a large addition of well-ripened wood. Some tender varieties of apple trees died from blight after having blossomed in the spring ; and cherry and plum trees, the former apparently more last year than the latter, were, as usual, afflicted with black-knot. But peach trees suffered severely, having been extensively winter-killed ; the first sign of decay was the falling of the leaves about blossoming time. Mr. D. W. Beadle, of St. Catharines, reports that in the Niagara peninsula "fruit trees have suffered less during the past season from diseases or from insects than for some time past." The codling worm on apples, and the curculio on plums and cherries, continue here, as elsewhere, to be sources of complaint, but they appear to have been less harmful than usual. The rose bug is reported to have reduced the grape crop in Etobicoke township (York) ; and a Saltfleet (Wentworth) correspondent says that "dwarf pears and quinces were injured by a slug on the foliage in the summer." In Lincoln, Wentworth and Halton there was a fair surplus of all the principal fruits, except peaches, which from the injury sustained by the trees were very deficient everywhere but in the vicinity of Niagara. Beyond the limits of the counties named, cherries and plums were scarce and dear. Apples and small fruits, however, have been universally plentiful.

The reports from the St. Lawrence and Ottawa counties refer almost wholly to apples and plums, which are the standard fruits of this region. Most of the more northerly townships as yet attempt to grow only native seedlings, depending on the west for their supplies of the finer varieties. There was, however, in the counties bordering on the St. Lawrence, a fair surplus of good apples last year, but the market was affected by the same stagnation that prevailed throughout the Province generally. In the township of Williamsburg (Dundas) the poorer qualities were reported to be selling at the marvellously low price of fifteen cents a bushel, but this was doubtless a highly exceptional case. Apart from the severe frosts of last May, which shortened the yield of both plums and apples considerably, hostile influences have been comparatively few. The curculio, however, appears to be extending its operations throughout this district. A Palmerston (Frontenac) correspondent says : "For the first time my plums were much injured by the curculio." Black knot is found on cherry trees more commonly than on plum trees in this district, and in some counties the borer has been at work on apple trees. Still fruit trees as a rule made a healthy, vigorous growth during the season, and at its close looked quite promising.

The southerly townships of the East Midland counties, to which the fruit-growing of the district is chiefly confined, have yielded sufficient apples for home requirements, and a moderate surplus for export. Other kinds of fruit, however, are mostly deficient, except small fruits, which have been plentiful everywhere. The crop of wild fruits, especially raspberries, was enormous. In the vicinity of Haliburton a correspondent says "thousands of tons of raspberries went to waste—it was the heaviest crop I ever saw." Spring frosts aud insect pests are complained of, but not seriously. Orchards are generally in a fair condition of health and vigour. A few trees were girdled by mice last winter. Mr. Thomas Beall, of Lindsay, reporting for his neighbourhood, says : "All fruit trees are in good condition except plums, most of which were destroyed last winter—cause, heavy bearing last year ; the trees which remain are only partially recovered."

The fruit-growing industry makes but slow progress in the northern districts of the Province. Every winter kills a certain number of trees ; yet a sufficient proportion survive in various parts of the territory to encourage perseverance. Of course the supply of all cultivated fruits is as yet extremely deficient. A Bracebridge correspondent says : "Quite a few farmers are beginning to have a few trees bearing ; there is probably a bushel or two in the largest orchard in this township, but I think in a few more years we shall be able to raise plenty." Crabs were plentiful, as were also wild fruits.

FROM THE MAY REPORT.

W. Sutherland, Ekfrid, Middlesex : I have kept a record of the time of blossoming of the wild plum for the past fourteen years, varying from April 27 in 1871 to May 19 in 1873. I find the average to be May 10, the day on which it blossomed this year. The cherry and apple have not followed this year as soon as in other years. Plum and peach trees and grape-vines were injured by the early frost last fall, preventing the young growth from ripening, which was consequently winter-killed ; apples, pears and cherries are blooming fairly. Plum and peach, no blossoms.

E. A. Carver, Albemarle, Bruce : Having a large orchard of 2,200 trees, (1,900 of which—770 dwarf pears, 70 standard pears, 570 plums, 380 apples, 50 crab apples, 10 peaches, 5 quinces, 50 apricots and nectarines—were planted out last year) I watched the trees very closely, and I observed at the end of March the young plums and peaches looking remarkably strong and healthy, and a fortnight afterwards sadly blighted, though, thanks to the wet we are having now, I shall only lose a few from the effects of this blight. Dwarf pears near fences or shelters, but *nowhere else*, were badly injured by being broken down by the snow. Quinces not much injured.

Robert N. Ball, Niagara, Lincoln : Fruit is becoming more a specialty with some land owners. I have over 100 acres in fruit now, and expect to extend the area next year ; many others are also planting largely. . . In January a cold wave passed over this county, killing the peach buds in all parts except in the

township of Niagara. At Niagara the glass registered 2° below zero, at St. Catharines 18° below, and at Grimsby 26° below.

T. A. Walker, Ancaster, Wentworth: The proper time to take off the black knot is just about the time fruit is ripe; destroy it or cut it off them, and very little will be seen next year.

W. McCraney, Trafalgar, Halton: The prospects of the strawberry crop are good. There will probably be 500,000 baskets in this vicinity, or in the neighbourhood of 15,000 bushels.

John J. Bennett, North Monaghan, Peterborough: I took the trouble last fall to raise a hill of earth around my apple trees to the height of about a foot, and out of 200 trees I only lost two by the mice.

Wm. Macklin, Haldimand, Northumberland: The ravages of field mice have been very great on fruit trees of all descriptions, the great depth of snow affording those rodents a warm and sure retreat. Some trees have been stripped of bark into the branches. The damage will be very great on fruit growers here.

FROM THE AUGUST REPORT.

C. Jarvis, Brantford, Brant: The pear trees are drying up, turning yellow and dying, and the trunks of some fine trees are rotting, though young. I do not know the cause.

Samuel Edmonstone, Keppel, Grey: Apple trees injured by blight; shoots dying all over the trees.

Andrew Grier, Collingwood, Grey: There is a blight in a great many of the apple orchards. The outside branches of the apple trees are dying.

William Milne, Osprey, Grey: Fruit will do pretty well here, and there are many young orchards.

Jasper Golden, Gosfield, Essex: Peaches a total failure—not a bushel for miles around Kingsville, or in the south of Gosfield, nor many in the north. I cannot account for the failure. Some say the cold spring winds; some say the severe cold winter

Alexander Thomson, Yonge, Leeds: We have no worm to any extent in apples this year, and the trees are looking well; the only trouble is the borers, which injure the young trees a good deal. There are neither pears nor peaches in this locality. Plums are poor, and are destroyed nearly every year by the "blast." The cherry crop, too, is very poor, and the trees are nearly all destroyed by the black knot. Strawberries were ruined by the frost and drought. Grapes were badly injured by the frost, but the second bud developed after a long time and the vines are looking very well now. The small fruit as a whole is a good deal under an average.

FROM THE NOVEMBER REPORT.

Joseph Alton, Strong, Parry Sound: I think it would be a good idea if the Government would send some fruit trees of the hardier varieties to five or six good farmers who would give them a fair trial, for I think fruit can be raised here as well as in other places.

John S. Hart, Drummond, etc., Lanark: This is not a fruit-growing section, and all fruits have to be brought in. The apple crop of such native seedlings as grow here was very large, and the local market was well supplied, but all the finer varieties have to be imported. Only the native red plum is grown here, and no peaches or pears. I may say hat the Fameuse (Snow) apple can be grown here to perfection, but is not generally grown.

PART III.

LIVE STOCK, THE DAIRY AND THE APIARY.

LIVE STOCK.

Pasture land throughout the Province was generally in fine condition until the drought of the latter part of June and the beginning of July set in. In some localities in almost every part of the Province, though fortunately not over a very large area in the aggregate, the dry weather parched the pastures beyond recovery, particularly in the county of Bruce and in some of the northern townships of Huron, Lambton and Wellington. The effects were felt, of course, in the condition of live stock of all kinds, as well as in the output of dairy products. As one correspondent in Guelph township, Wellington county, tersely expressed it in the August report, pastures were not prominent, but there was plenty of bottom awaiting rain, and when the rain came, as it did very copiously over a large section of the Province in the latter part of July, pastures revived astonishingly, with correspondingly good effects on live stock. Later on, as stated in the report of the Bureau for November, the warm rains which fell over a large portion of the Province in the latter part of September and the early part of October had a wonderfully reviving effect even on pastures which had become dry and short from the previous drought. Their condition as a general thing was surprisingly good, and even where they were reported rather short for cattle the grass was said to be fresh and tender. The condition of live stock of all kinds was also unusually good, for, though they were reported thin in those localities in which the pastures suffered most severely from the drought, there was not a single case of disease of any kind mentioned by correspondents, and cattle, sheep and hogs all appeared to be in fine healthy condition.

Grass-fed cattle not intended for the stall were generally disposed of in pretty good condition, if not at very good prices, and a somewhat larger number were apparently sold by live weight off the grass by those farmers who, when prices are more promising, are accustomed to stable-feed their cattle. In some localities the same departure from the usual practice is attributed to the scarcity of turnips. Even in those localities where winter fattening is extensively carried on few cattle had been housed in the last week of October, except near towns and cities, with an eye to the Christmas market. Excepting in those localities where farmers only attempt to meet the local demand there was generally reported a good supply of cattle, and taking the Province as a whole there appeared to be a surplus larger than usual, with rather a low demand ; although in some localities, or, more strictly speaking, in some parts of counties, there was reported a scarcity of cattle for export.

About the same remarks apply to sheep as to cattle—only in a greater degree,—that is to say, there was reported an abundant supply in fairly good condition, with very little demand.

As to pork, farmers generally speak less gloomily, especially in the Lake Erie counties, where this branch of agriculture is a large and important industry. Corn and peas were abundant, hogs were plentiful, fattening was progressing satisfactorily and prices were fairly good—such is the general tenor of the reports.

The number of horses in the Province for the years ending on the 25th June, 1883 and 1884 respectively, was as follows:

	1884.	1883.
Working horses	303,474	349,552
Breeding mares	93,910	87,380
Unbroken horses	138,569	123,201
	535,953	560,133

The number of cattle in the Province on the 25th of June, 1883 and 1884 respectively, was as follows :

	1884.	1883.
Working oxen	16,793	17,071
Milch cows	710,519	690,437
Store cattle (over two years)	384,453	321,471
Other cattle	813,905	789,075
Totals	1,925,670	1,818,054

It should, however, be explained with reference to the above figures that those for 1883 are exclusive of 10,559 head of thoroughbreds which in the report for that year were classified by breeds, whereas the above column for the year 1884 includes thoroughbred as well as grade and native cattle.

A summary of the returns of sheep for the years 1883 and 1884 is presented in the following table :

	1884.	1883.
Coarse woolled (over 1 year)	994,608	1,043,080
" (under 1 year)	595,996	580,095
Fine woolled (over 1 year)	176,341	150,281
" (under 1 year)	123,788	95,328
Totals	1,890,733	1,868,784

The Report of the Department of Agriculture at Ottawa shows that for the year ending December 31, 1884, the number of cattle exported from Canada was 61,843, valued at $7,730,375 ; and of sheep, 67,197, valued at $671,970—the great bulk of them from Ontario. For the preceding year the number of cattle exported was 61,843, and of sheep, 114,352. The decrease in the exports of sheep is due in part to the low price in the British markets, but chiefly to the competition to which Canada is subjected by the frozen mutton trade of the Australian colonies. The fall in the price of cattle did not prevent a considerable increase in the number of animals exported, but dealers who were not careful buyers are believed to have met with heavy losses.

The number of thoroughbred cattle imported by Ontario farmers last year was 281, of which 201 were quarantined at Quebec and 80 at Sarnia. They comprised 83 Shorthorns, 67 Herefords, 52 Holsteins, 29 Galloways, 26 Jerseys, 14 Polled Angus, 4 Guernseys, 4 Ayrshires and 2 Devons. Owing to the outbreak of contagious pleuro-pneumonia among the herds of Illinois, importation at Sarnia was prohibited for a short time in the fall.

The imports of sheep where wholly from Great Britain, and those of Ontario farmers comprised 120 Shropshires, 58 Southdowns, 37 West Highlands, 19 Cotswolds, 11 Oxfords, 10 Lincolns, 7 Hampshires, 7 Leicesters and 3 Cheviots.

CHEESE.

It is not likely that complete statistics of the cheese factories of the Province can ever be obtained until returns are made compulsory ; yet there is a steady improvement in the number giving information to the Bureau from year to year. Thus, in 1882 the number of factories for which returns were obtained was 306 ; in 1883 the number was 440 ; and in 1884 it was still further increased to 567. An estimate of the quantity of milk converted into cheese, of the quantity of cheese made, and the value of the cheese for all the factories of the Province, based on the returns received, would give the following results for the three years :

	1884.	1883.	1882.
Pounds of milk used	685,964,727	539,696,197	409,144,701
Pounds of cheese made	66,939,573	53,513,032	39,346,095
Value of cheese	$6,998,889	$5,589,339	$4,259,141

The number of factories reported in operation in 1882 was 471 ; in 1883, 635 ; and in 1884, 751.

A comparison for the three years of factories which gave returns of milk used, cheese made, value of cheese sold, number of patrons and number of cows whose milk was supplied, gives these results:

	1884.	1883.	1882.
No. of factories reported	445	385	266
Quantity of milk used ..... lbs.	426,260,665	327,353,679	233,105,965
Quantity of cheese made ..... lbs.	41,595,027	32,495,811	22,372,566
Quantity of milk for 1 lb. of cheese	10·24788	10·07372	10·41927
Value of cheese ..... $	4,357,208	3,396,882	2,401,712
Value of cheese, per lb. ..... cents	10·47531	10·45329	10·73508
No. of patrons	24,015	19,797	13,349
Average No. of patrons per factory	54	51	50
No. of cows, whose milk was supplied	158,366	117,577	85,226
Average No. of cows per factory	356	305	320
Average yield of milk per cow ..... lbs.	2,692	2,784	2,735
Average produce of cheese per cow ..... lbs.	262·7	276·4	263·5
Average value of product per cow ..... $	27.51	28.89	28.18
Average return for each patron ..... $	181.44	171.59	179.92
Average number of working days	159	156	.....

The comparison throughout is almost entirely in favour of 1883, and notably so in the average quantity of milk required to make a pound of cheese, as well as in the average product and the value of product per cow. The average number of patrons per factory is considerably larger for 1884 than for 1883, as is also the average return for each patron. The average yield of milk per cow for the season is 92 lbs. less than in 1883, and 308 lbs. less than the standard. The unfavourable averages for 1884, it may be stated, are almost wholly accounted for by the returns for one of the large combinations in the county of Glengarry, and are probably the result of an error in these returns.

The western and eastern dairy centres of the Province still continue to afford studies of interesting comparison. Taking the full returns for the principal cheese-making counties in each, we get these figures:

Western.	Days Worked	Cows.	Milk.	Yield of Milk per Cow per—		Cheese.	Value.
				Season.	Day.		
	No.	No.	lbs.	lbs.	lbs.	lbs.	$ c.
Elgin	162	4,728	13,349,164	2,823	17.4	1,286,357	136,399 40
Norfolk	165	4,480	13,097,925	2,924	17.7	1,266,404	133,738 54
Lambton	145	4,297	10,576,520	2,461	17.0	991,349	104,525 57
Huron	142	4,173	11,839,995	2,837	20.0	1,134,543	122,798 38
Bruce	137	3,191	8,150,910	2,554	18.6	783,762	82,616 27
Middlesex	168	10,432	31,500,950	3,020	18.0	3,018,615	328,840 30
Oxford	182	16,801	52,507,491	3,125	17.2	5,016,725	549,544 10
Perth	156	7,718	22,862,923	2,962	19.0	2,177,700	238,656 12
Wellington	153	3,704	10,756,396	2,904	19.0	999,679	109,081 44
Totals	164	59,524	174,642,274	2,934	17.9	16,675,134	1,806,200 12
Eastern.							
Northumberland	159	6,280	18,433,701	2,935	18.5	1,819,747	182,420 68
Prince Edward	163	3,069	8,622,455	2,810	17.3	856,389	86,913 44
Lennox and Addington.	153	6,195	14,675,522	2,369	15.5	1,465,680	148,533 02
Frontenac	148	3,684	9,324,258	2,531	17.1	943,219	95,108 33
Leeds and Grenville	165	18,882	52,943,034	2,804	17.0	5,320,079	554,678 54
Lanark	142	4,413	10,711,689	2,427	17.1	1,063,072	107,263 12
Peterborough	148	2,696	7,296,735	2,707	18.3	707,304	69,902 51
Hastings	165	14,704	42,907,825	2,918	17.7	4,312,716	439,820 99
	159	59,923	164,915,219	2,752	17.3	16,488,206	1,684,640 63

In order to extend the comparison over two years, we present the totals for 1883 and 1884 for the two districts :

	Western Counties.		Eastern Counties.	
	1884.	1883.	1884.	1883.
No. of working days	164	160	159	156
No. of cows	59,524	44,183	59,923	41,323
Pounds of milk	174,642,274	128,875,665	164,915,219	111,748,070
Yield of milk per cow—				
For the season ....lbs.	2,934	2,917	2,752	2,704
Per day ....lbs.	17·9	18·2	17.3	17.3
Cheese made ....lbs.	16,675,134	12,467,389	16,488,206	11,404,714
Value of cheese ....$	1,806,200	1,332,529	1,684,640	1,156,766
Value of cheese per lb. ....cts.	10·8317	10·6881	10·2173	10·1429
Value of product per cow—				
For the season ....$	30.34	30.16	28.11	27.99
Per day ....cts.	18·5127	18·8496	17·6723	17·9444

For each year the western district has had the advantage of a longer season of working than the eastern—the difference in its favour being four days in 1883 and five days in 1884. It also surpasses the east in the average yield of milk per cow, in the yield per day, in the price of the product, and in the value of product per cow for the season and per day. In the west the average price of cheese per lb. last year was 10.8317 cents, against 10.2173 cents in the east ; or a difference of 61½ cents per 100 lbs., against 54½ cents per 100 lbs. in 1883. On the other hand, the quantity of milk required to make a pound of cheese in the western counties last year was 10.4732 lbs., while in the eastern counties it only required 10.0020 lbs., or about one-twentieth of a pound less than the difference in 1883. The returns for the three years 1882, 1883 and 1884, give the following averages for the eastern and western counties :

Average for three years of—	Western Counties.	Eastern Counties.
Yield of milk per cow ....lbs.	2,970	2,655
Product of cheese per cow ....lbs.	282·32	266·40
Value of product per cow ....$	30·52	27.60
Value of cheese per lb. ....cts.	10·8111	10·3588
Lbs. of milk to make 1 lb. cheese	10.5186	9·9657

In 1884 as well as in 1883, the counties of Oxford and Middlesex were the only ones in the Province in which the average yield of milk per cow exceeded the standard of 3,000 lbs. for the season ; but this credit is mainly due to the number of days during which milk was supplied to the factories. Perth and Wellington for the same number of days as Oxford would each have given a return of 3,458 lbs. for the season against Oxford's 3,125, and Huron would have given a return of 3,640 lbs. The latter county gives the highest average of value of product per day, being 20.7 cents for each cow ; but Oxford gives the highest average of product per cow for the season, being $32.71, or $5.20 higher than the average for the Province. Middlesex stands second at $31.52, and Perth is third at $30,92. Of the eastern counties, Hastings stands first at $29.91 ; Leeds and Grenville are second, at $29.38 ; and Northumberland is third, at $29.05.

It is admitted now, as appears by the report of the last annual Convention of the Eastern Dairymen's Association, that the difference in the price realized in the sales of eastern and western cheese is due to the inferior quality of the former, and last year an earnest endeavour was made to improve the make of eastern cheese by the employment of travelling instructors. But further improvement is still desirable, both in the eastern and some of

the western counties ; for had the same prices been realized everywhere as in the West Midland counties, the product returned to the Bureau might have been increased by $212,000, and that of the total estimated product of the Province by nearly $300,000.

BUTTER.

There is no improvement to report in the fulness of the statistics of our butter product. Farmers were asked to give in the June returns the quantity of butter made by them during the previous year, but in a large number of the schedules sent in this item was left blank. The quantity as given was 32,844,269 lbs., but the total is doubtless a third more. The number of creameries reported in operation was 23, being 4 less than in 1883 ; and the number making returns was 8, as against 13 for the previous year. The following table gives the statistics obtained for 1884, and the totals for 1883 :

Counties.	Creameries.			No. of Patrons.	Butter.		Cheese.		Total Value of Produce.	Average Price of Butter, per lb.
	No. in Operation.	No. Making Returns.	No. Making Cheese.		Quantity Made.	Value.	Quantity Made.	Value.		
					lbs.	$ c.		$ c.	$	cts.
Huron	3	1	..	61	19,911	4,139 71	.....	.....	4,139 71	20.79
Perth	1	1	..	112	30,523	6,153 00	.....	.....	6,153 00	20.16
Wellington	1	1	..	61	4,127	1,031 75	.....	.....	1,031 75	25.00
Waterloo	2	2	1	110	46,172	9,921 35	69,940	4,986 23	14,907 58	21.49
Prince Edward	2	2	2	160	9,854	2,157 18	189,748	15,799 63	17,956 81	21.89
Dundas	3	1	..	36	37,337	8,684 77	.....	.....	8,684 77	23.26
Other counties	11	..	..	....	.....	.....	.....	.....	.....	.....
Totals for 1884	23	8	3	540	147,924	32,087 76	259,688	20,785 86	52,873 62	21.69
1883	27	12	3	639	243,902	51,816 99	134,446	11,218 28	63,035 27	21.33

Of the creameries giving complete returns of the number of cows whose milk or cream was supplied during the season, five made butter only, and three made butter and cheese—being the same as the corresponding returns for 1883, although not for the same creameries. The results for the two years are as follows :

	1884.		1883.	
	Butter making.	Butter and Cheese making	Butter making.	Butter and Cheese making
Number of creameries	5	3	5	3
Average number of patrons	335	205	281	95
Average number of cows	1,591	1,000	1,140	803
Quantity of butter made ..... lbs.	118,288	29,636	94,883	56,930
Quantity of cheese made ..... lbs.	.....	259,688	.....	134,446
Value of product ..... $	25,717.21	27,156.41	19,618.88	23,608.99
Value of season's product per cow ..... $	16.16	27.16	17.21	29.40
Value of daily product per cow ..... cts.	13.71	17.84	.14½	.18½
Average date of opening	June 3	May 14	May 21	May 1
Average date of closing	October 20	October 26	October 9	November 1
Average number of days operated	118	152	119	159

It is scarcely possible from so small a number of returns to make deductions of any important value. If they establish anything it is that a larger return in cash is obtained from creameries which make butter and cheese than from ones that make butter alone ; for it is hardly possible that the value of buttermilk for any purpose can make up the difference.

FROM THE MAY REPORT.

Silas Mills, Moore, Lambton: More attention is being paid to the improvement of stock by importing superior thoroughbred animals—Shorthorn chiefly.

Samuel Smillie, Tuckersmith, Huron: The low prices of wheat caused by the western competition is causing farmers to relinquish wheat-growing and to turn their attention to live stock, especially cattle and horses. There have been imported into Huron county during the last twelve months more than one hundred head of heavy horses and mares for breeding purposes. Improvement in cattle keeps pace.

G. Edwin Cresswell, Tuckersmith, Huron: The attention paid to live stock is decidedly the most noticeable feature of the farming of to-day. The improvement in style and quality of stock is remarkable.

Peter Clark, Culross, Bruce: It is the opinion of some that the Ontario farmer will find a difficulty in competing with other countries in supplying the "staff of life" to the British consumer, owing to the facilities with which other countries can supply wheat; and I think it would be well for farmers in this section to turn their attention more to the growing of coarse grains, etc., and go more into raising and fattening stock. Wheat has rather turned its back on us in the meantime.

Wm. H. Free, St. Vincent, Grey: The stallions owned by the Sydenham and St. Vincent Stock Importing Company have been a success, and they bid fair to improve the stock of this section. I would recommend the farmers to co-operate in this way, by forming joint stock companies. By this means they can procure stock for breeding which would be beyond the reach of private individuals.

Joseph M. Rogers, Sydenham, Grey: Considerable interest is taken in the improvement of the horses and cattle of this locality by the introduction of Percheron, Clydesdale and thoroughbred horses and Durham bulls; also in sheep, by breeding from Cotswold, Leicester, Southdown and Shropshiredown rams.

Thomas Kells, Artemesia, Grey: Farmers in this part of the county seem to be getting wide awake to the advantage of stock-raising and dairying. There are two cheese factories in this township. Good cows are much sought after, but are hard to find. We lack very much in thoroughbred sire stock, as farmers are now going more into stock-raising.

William Watcher, North Dorchester, Middlesex: Farmers are keeping more cows this season for the cheese factories than usual. The good price of cheese last year and the failure of the grain crops are likely the cause.

James Cross, Peel, Wellington: We farmers must give up sowing fall wheat, as coarse grains and cattle-feeding will pay better and be advantageous to the land. Also, our land must be drained if we want to make money or pay our debts.

E. J. Honey, Percy, Northumberland: Farmers are turning their attention more each year to the raising of stock, principally cattle, although some farmers keep good flocks of sheep, generally of the long-woolled breeds, which pay well, although the price of wool is low.

George Lott, Richmond, Lennox: The market for fat cattle is good, prices averaging about 5¾ cents on foot. There is more interest taken in improving the stock of horses in this county than any other kind of stock. Well bred cattle especially are scarce.

James Clark, Kenyon, Glengarry: Our farmers have been somewhat careless in the past, but are picking up considerably in improving their stock both of cattle and horses. A half dozen valuable horses were imported into the county this season, comprising Bloods, Clydes and Percherons.

Alexander Buchanan, South Gower, Grenville: The worst outlook in this district is the want of store cattle. There is a great demand at good prices for beef; but the horned cattle in this section are a very poor class indeed.

James Early, Chaffey, Muskoka: This township is best adapted for stock; there being fine grass and good water, stock is what we must depend on.

James Budger, McDougall, Parry Sound: Vegetation grows fast in these northern regions, and plenty of feed for cattle and sheep comes almost as soon as the snow disappears. I think this is one of the best stock-raising districts in Ontario.

FROM THE AUGUST REPORT.

Dugald Campbell, Dunwich, Elgin: Fat stock pretty well cleared out at present by shippers.

George Dewar, Plympton, Lambton: Fat stock is in better condition now than at the same date last season, and dairy produce is also more abundant.

John McMillan, Hullett, Huron: The sale of beef cattle is rather dull at present, and prices at least half a cent per pound lower. Farmers are looking more to cattle raising than ever; more beef cattle in this locality than any past year. Keeping scrub bulls is a great injury to the cattle interest generally, as superior animals always command a good price.

Robert C. Brandon, Brock, Ontario: Horses improving in condition rapidly, our township being largely improved by Clydesdale stallions.

Alexander Thomson, South Leeds: Pastures are in fine condition; the aftermath is splendid and live stock of all kinds are looking well. Fat stock will be quite plentiful this fall as the scarcity of hay in the rear of the township is causing the farmers to dispose of all surplus stock, which will be fattened later on. As for dairy produce, cheese takes the lead. There has been and is at present a large production of this staple, and prices are fully one cent per pound higher than last year.

Thomas McDowell, South Gower, Grenville: The dairy produce, so far as I can learn, is excellent. There is very little soft, white, oily butter, on account of there being very few thunderstorms. The nights were cold.

FROM THE NOVEMBER REPORT.

T. L. Pardo, Raleigh, Kent: I think there will be more stock fattened than usual this winter, as coarse grains are plentiful and very cheap; it will not pay to sell them, and perhaps will not pay to feed them, as beef is almost sure to be low next spring.

James Morrison, Walsingham, Norfolk: Farmers are boiling up their potatoes to fatten hogs; they are worth only from 15 to 20 cents per bushel here.

J. R. Martin, North Cayuga, Haldimand: I farm 300 acres in North Cayuga, 450 in Seneca, and 250 in Oneida, chiefly stock raising. I find the cattle and horses and hogs quite profitable, but the sheep, owing to the low price of wool, scarcely hold their own.

John McMillan, Hullett, Huron: The dry summer and fall weather has shown the necessity of farmers sowing some kind of feed for soiling purposes. Corn is the best adapted for early fall feed, but should be taken off before the fall frosts set in, as they spoil it. In dry seasons I think mangolds a surer crop than turnips, but they must be taken in before severe frost.

G. E. Cresswell, Tuckersmith, Huron: Considerable cattle will be stall-fed this winter. Numbers of farmers could not get their cattle in proper condition for sale, owing to the drought. Large quantities of lean cattle have been sold for the American and English market as stockers.

James Johnston, Carrick, Bruce: The dairy industry is gradually gaining ground. In this township we have two cheese factories and two creameries. Cheese for the last two years seems to be in greater favour than butter, but only, I think, on account of an *apparently* greater profit, few considering the real value of the skim milk left on the farms of those who patronize the creameries.

Robert Russell, Greenock, Bruce: There was a general complaint about the quality of the early butter. Merchants say there was not a pound of good butter to be had till the fall rains set in.

George Binnie, Glenelg, Grey: A large amount of butter is made in this section, and while much of it is fit for the table of a prince there is, I fear, a large amount of very inferior butter put on the market. Indiscriminate buying by store-keepers is the chief cause of the mischief, for when bad butter commands the same price as good there is no incentive to improvement.

Wm. Milne, Osprey, Grey: In a few years there will be a vast change in the class of cattle here. Till lately the cheapest bulls were used, and those who ventured to get throughbred ones were not patronized; but when buyers collected their droves about the hotel yards, farmers bringing in cattle were made to see and feel the difference between a scrub and a good grade. Now there are a number of throughbred Durham bulls, all well patronized. The same may be said of horses. At our show colts were numerous, and some very fine.

W. H. Ryan, Normanby, Grey: Too much cropping here and not enough feeding of fat cattle, though we are improving in this respect.

W. W. Colwell, Essa, Simcoe: I think, owing to the low prices ruling for wheat, especially this fall, and the conviction generally felt that unless under some very exceptional circumstances the high prices of some former years are never likely again to return, in consequence of the great increase of production probable in the North-West and other wheat-producing countries, farmers are turning their attention more to stock-raising and fruit and dairy products, and will continue to do so.

Thomas Shipley, East Williams, Middlesex: If it is possible for you, try to further the advantages of shipping stock to Britain, as regards space, freight, insurance, etc.

F. Malcolm, Blandford, Oxford: A partial system of soiling is on the increase because it pays, and those who practice the system know it does. Large quantities of bran are fed during the summer.

Wm. Whitelaw, Guelph, Wellington: A very large quantity barley will be fed, owing to low prices and bad colour and condition. But I believe the farmer will make more money by feeding to stock than selling at present prices.

T. McCrae, Guelph, Wellington: Barley will be fed more than usual on account of colour and low price. Black barley is being grown by some for feeding purposes, and is said to give good returns.

Wm. Brown, Guelph, Wellington: The Experimental Farm creamery has made a very vigorous start, and satisfactory terms with farmers. Farmers are carefully weighing the importance of improved pastures, less wheat and better live stock.

George F. Lewis, Saltfleet, Wentworth: I think it would be better if farmers would turn their attention more to stock and dairy, especially stock. Either horses (heavy draught or roadsters), cattle or sheep, would pay better than so much grain.

W. M. Calder, Glanford, Wentworth: I think the practice is becoming more and more prevalent of keeping hogs always in good condition, so that when sufficiently grown they are fit to kill, the process being repeated all through the cold season, as the animals mature and the market invites.

John Sinclair, Chinguacousy, Peel: The farmers of this locality are paying much more attention to the rearing and fattening of cattle than they did some years ago. Farmers who used to raise one or two calves now rear six or seven in a season.

John Beasley, King, York: I am under the impression that a great deal of grain will be fed on the farm this year. I have heard some farmers say they will feed their Wild Goose wheat, and are buying stock for that purpose.

A. J. Brooks, Sophiasburg, Prince Edward: This country has run all to barley for years back, with no stock or roots, but it will have to change soon.

Dr. Elkington, Palmerston and Canonto, Frontenac: This is a wild, rocky country, with beaver meadow ntervals. It can never be an agricultural section, but if the flats, marshes and meadows were drained and eeded down for winter keep, it ought to raise very superior cattle. Dogs and wolves destroy the sheep.

Alex. Thomson, Yonge Front, Leeds: I certainly think we are behind in some things in this township; the breed of cattle, for instance, for dairy purposes. I think the Jerseys and Shorthorns are superior to the common breed used in this township.

J. C. Rutherford, Oxford, Grenville: Our township is fast going into dairying, and less grain for market every year.

John N Poole, Crosby North, Leeds and Grenville: There has been a good deal of sickness among the cattle this season—more than usual—and some have died. The complaints are new.

A. M. Campbell, Kenyon, Glengarry: Milch cows properly handled will produce 4,000 pounds of milk during the six months our cheese factories are in operation.

James Wylie, East Hawkesbury, Brescott: Butchers of Montreal take cattle and sheep down to their market in good lots every week, and will find some more every week.

James McGregor, Wollaston, Hastings: I think horses do better on alternate feeds of boiled barley and oats than on oats alone.

J. C. Hanley, Tyendenaga, Hastings: Farmers have been lately increasing their stock.

John Bailey, Laxton, Victoria: Our farmers here are too careless about improving their stock. They are losing hundreds of dollars annually by not having their horned cattle graded with Durham. Good beef cattle and good steers of any age command a good price, and this township is well adapted for raising stock. We have good, pure water, and the grass springs up early in the season. I have known cattle to be turned into the woods as soon as the snow went off, and they did well.

John Hollingworth, Watt, Muskoka: Stock is generally taken here as you can catch them, fat or not, and butchered. The supply is likely to be sufficient for local demand, but owing to the building of the railway that demand is greater than usual.

John Young, Armour, Parry Sound: Live stock in general are in good condition. Owing to the building of the Pacific Junction Railway there is going to be a good market.

THE APIARY.

The reports as to bees and honey are extremely contradictory—so much so, even within a distance of a few miles, that it is difficult to base upon them a general statement of the year's produce. Local conditions as to temperature, supply of bloom, etc., have no doubt a good deal to do with these results, but doubtless they are also to some extent attributable to the varying degrees of skill and experience brought to bear upon this industry. A good many apiarists report that bees did well in the early part of the season, but that the dry weather and scarcity of blossoms seriously interfered with their operations in the latter part of summer, and in the fall. Others say that bees swarmed abundantly but produced little honey, while according to other correspondents exactly the reverse was the case. In some parts of the Province, particularly on Pelee Island and the mainland shores of Essex, a large proportion of the bees died in the winter from some unexplained cause. Two statements it is safe to make with regard to this industry. One is, that prices of honey realized by producers have been much lower than usual, and the other that apiculture is not only largely on the increase in almost every part of the Province, but it is being carried on more and more intelligently every year.

Among the reports received the following are quoted: Howard, Kent county: "I hear from most bee people that bees did not do much; very late swarms, or none at all, and no surplus honey. The majority of colonies are not, I think, in good condition, on account of the dry fall, there being no fall flowers. They also stopped breeding early, consequently the bees are old and short of supplies, and should we have a severe winter I look for a great mortality among them, as few apiarists pack during the winter months. Packing in chaff or sawdust, which has been made perfectly dry, or any other such material, is one of the greatest essentials of successful bee-keeping." Blandford, Oxford county: "Bees are greatly on the increase in this county, many going into the business for a livelihood. The average yield per colony is about 75 pounds; one apiarist here took 130 pounds. The honey is almost entirely white clover." Ekfrid, Middlesex: "Bees have done well, and a great quantity of honey has been made. Much of it is dark in colour, the bees having gathered the honey dew, which has been exceedingly plentiful," Hullett and Goderich, Huron: "Yield under half an average; colonies in poor condition; prices of honey low, offered at twelve cents without market; a good deal sold here at ten cents." Bruce, Bruce county: "The honey crop was rather a failure. Clover was the only honey source; basswood was of no account. There is a prospect of a heavy loss of bees during the winter from the quantity of honey dew gathered during August and September. Where bees have not been fed they are very light in stores." Palmerston and Canonto, Frontenac: "Only a few hives exist; at which I wonder, for a better bee country I do not know. Plenty of blossom from the basswood, clover, etc. I strongly recommend Italian bees where so much red clover abounds."

PART IV.

VALUES, RENTS AND WAGES.

VALUES OF FARM PROPERTY AND CROPS.

The value of farm property in the Province last year, according to the returns made by farmers themselves, shows a decrease of $30,000,000 in land, but an increase of $10,000,000 in buildings, $4,500,000 in implements, and $3,500,000 in live stock. For three years the comparison stands as follows:

	1884.	1883.	1882.
Land	$624,114,706	$654,793,025	$632,342,500
Buildings	173,121,740	163,030,675	132,711,575
Implements	48,111,049	43,522,530	37,029,815
Live Stock	103,568,045	100,082,365	80,540,720
Totals	948,915,540	961,428,595	882,624,610

The decrease in the value of land last year, as compared with 1883, was uniform throughout the Province, and was probably a consequence of the fall in prices of farm products. There was a prevailing impression in 1882—the first year in which those statistics were collected—that the enquiry was directly or indirectly connected with some scheme of local taxation, and in many instances the returns were considerably below real values. In the following year, however, there was a feeling of greater confidence evidenced with regard to the object, and actual values were more generally given. For this reason it is not fair to assume that the increase as shown by the tables was an actual increase in the value of farm property. But it will be observed by the figures for 1884 that while there has been an increase in the values of buildings, implements and live stock, the land shows a very marked depreciation. The following table gives the comparison of values per acre under the several heads of property for 1883 and 1884:

Districts.	Land.		Buildings.		Implements.		Live Stock.		Total.	
	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Lake Erie	38 28	39 54	10 15	9 53	2 72	2 51	5 38	5 38	56 53	56 96
Lake Huron	32 95	34 62	7 54	7 20	2 22	2 04	5 45	5 31	48 16	49 17
Georgian Bay	23 76	25 61	6 14	5 98	2 00	1 88	4 52	4 32	36 42	37 79
West Midland	43 73	46 57	12 30	11 33	3 30	2 95	7 54	6 98	66 87	67 83
Lake Ontario	44 36	46 96	13 29	12 77	3 51	3 13	6 92	6 60	68 08	69 46
St. Lawrence & Ottawa	17 77	18 64	5 45	5 17	1 55	1 41	3 24	3 32	28 01	28 54
East Midland	15 18	15 95	4 01	3 88	1 13	1 09	2 42	2 52	22 74	23 44
Northern Districts	4 29	4 86	1 05	1 04	37	34	95	1 01	6 66	7 25
The Province	28 74	30 56	7 97	7 61	2 22	2 03	4 77	4 67	43 70	44 87

This valuation of the land ought to be studied in connection with the quantity and value of its products, for it is obvious that the demand for farm land must fluctuate considerably with the profits of what it yields. Large crops and good prices cannot fail to enhance the value of the land, while poor crops and low prices will have a contrary effect. The following table gives the total value and the value per acre of the staple grain crops of the Province for the last three harvest years :

	1884.		1883.		1882.		Average value per acre for 1882, 1883 and 1884.
	Total Value.	Value per acre.	Total Value.	Value per acre.	Total Value.	Value per acre.	
	$	$	$	$	$	$	$
Fall wheat	16,677,693	19 29	12,239,805	11 11	31,567,754	26 57	19 20
Spring wheat	11,892,264	16 48	10,406,887	17 75	10,245,959	17 48	17 18
Barley	10,247,806	14 63	10,496,172	13 86	15,784,865	18 60	15 84
Oats	19,097,476	12 89	20,737,971	14 62	21,715,731	15 65	14 36
Rye	984,010	9 52	2,018,201	10 73	2,223,231	12 00	10 96
Peas	8,817,395	15 44	7,578,343	13 96	8,144,525	14 52	14 66
Totals	67,716,644	15 24	63,477,379	13 83	89,682,065	18 85	16 02

The harvest of 1882 was bountiful and, although the market prices of grains were not as high as in former years, the aggregate values were very large—the average of the six grain crops of the table being $18.85 per acre. The harvest of 1883, on the other hand, was a partial failure, especially the crop of fall wheat, and this, together with a marked drop in the prices of barley, oats and peas, reduced the average to $13.83 per acre. It is therefore not surprising that the returns made by farmers should present a noticeable depreciation in the value of farm lands in 1884 as compared with 1883. The crop of 1884, although a very abundant one, did not give to the farmers a much larger return computed in money value than the one of 1883, owing to a yet more decided fall in market prices. The averages of the last half of each year for the leading markets of the Province, upon which the values of the crops are reckoned, were the following :

	1884.	1883.	1882.
Fall wheat per bushel	$0 80	$1 05	$1 01
Spring wheat "	81	1 07	1 06
Barley "	54	57	65
Oats "	33	38	43
Peas "	64	71	74
Rye "	60	62	64

RENTS OF FARM LAND.

In 1882 the rent of farm land was compiled from the returns of about 1,000 correspondents in various parts of the Province, but in 1883 it was made up from the returns of 22,868 farmers. The same plan was continued in 1884—the number of returns being 8,589. The following table gives the averages of rent per acre for the three years, in the several districts of the Province :

Districts.	1884.	1883.	1882.
Lake Erie Counties	$2 84	$2 92	$3 02
Lake Huron Counties	2 74	2 70	2 78
Georgian Bay Counties	2 26	2 25	2 47
West Midland Counties	2 90	2 91	2 98
Lake Ontario Counties	3 29	3 31	3 43
St. Lawrence and Ottawa Counties	2 13	2 13	1 97
East Midland Counties	2 32	2 28	2 76
Northern Districts	1 48	1 83	....
The Province	2 75	2 75	2 79

FARM LABOUR AND WAGES.

The tendency noted in the August report of the Bureau towards a full if not an over-supply of labour and lowering of wages has increased to a very decided extent in almost every part of the Province. The reports made to the November report by the vast majority of correspondents are practically the same as to these two facts: (1) That there is a plentiful supply of labour; (2) that wages are falling and are likely to fall. The cause almost universally assigned, either alone or in combination with others, is the low price of farm produce, which, it is alleged, will prevent the farmers paying the rate of wages recently prevailing, and at the same time reduce the cost of living to the farm servant.

But there are other factors in the problem which are scarcely less potent. One of these was strongly emphasized in the August report, namely, the introduction into harvesting operations of self-binding reapers and other improved machinery. Later reports confirm the impression then sought to be conveyed, that these machines are working something approaching a revolution in this question of farm labour. As several correspondents say, "with these machines we require no more hands in summer than in winter," and everyone familiar with the economy of the average Canadian farm knows what that means—what a reduction such a fact, if it be a fact, will make in the aggregate supply of labour necessary for the agriculture of this Province.

The total number of self-binders made and sold to farmers in the Province was about three thousand, and the effect had upon farm labour through their use was surprising. In May there was an apprehension of scarcity of help in the harvest days, and it was expected that wages would rule high. But when harvest operations began it was found that the demand was very slack, and that men were plentiful; consequently wages experienced a sudden drop. The result could hardly be otherwise when it is considered that one self-binder does very effeciently the work of four men, and that twelve thousand fewer harvest hands were needed than was anticipated a few weeks earlier in the season. But if this was the result in the harvest of 1884, a still greater result may be looked for in the approaching harvest. The manufacturers of self-binders report that they have eight thousand implements in process of construction, and if need be they can supply ten thousand—capable of doing the work of forty thousand men in the season when hitherto the demand for active men has been at its highest. The prices of self-binders, it may be observed, have been steadily reduced year by year, so that farmers are able to provide themselves with those labour-savers much more easily now than formerly. For example, the cash selling price of a five-foot elevated binder in 1882 and 1883 was $275; in 1884 it was reduced to $240; and for this year it is still further reduced to $210. This reduction is due in part to competition among the makers, but chiefly to greater economy attained in building a large number of machines.

One of the industries encouraged by the use of self-binders is twine-making. Last year about 400 tons of twine were consumed in binding, and it is estimated that about 1,200 tons will be required for the coming harvest. The great bulk of it is supplied by makers in Montreal and Halifax.

But there are other causes affecting the situation, some likely to be more permanent than others, which are so frequently mentioned in the reports that they cannot be regarded as merely accidental, and they therefore require to be noticed. The comparative cessation of the movement of farmers' sons and others forming part of the normal agricultural population of Ontario to Manitoba and the North-West territories, the return of a considerable number of those classes from the United States as well as our own North-West, and additions to the farm labouring class by immigration from Europe, are not unfrequently commented upon in the reports; while the dulness of the lumber trade in Canada and Michigan is referred to over and over again as helping to account for the condition of the labour market in those parts of the Province upon which the lumber shanties usually make large draughts of young men. It should be mentioned, however, that both as to the effects of the North-West movement and of the lumber trade there are some exceptions to the general tenor of the reports. Two or three correspondents in the eastern part of the

Province predict that wages will not fall, and may probably rise, on account of the demand for lumbermen, while one, writing from the county of Middlesex, says that wages will rise "because many are leaving for the North-West." Some correspondents also in the northern parts of the Province are of opinion that wages are likely to remain stationary, or even to rise a little, on account of railway construction in progress, but such reports are local and exceptional.

Still another cause of the expected surplus of labour—and one which may possibly prove more permanent than some of those already mentioned—is the fact that in many parts of the Province farmers seem more and more inclined to turn their attention to grazing and stock-raising instead of wheat-farming. This tendency, noticeable of late years in many localities, but attributable chiefly to local causes, such as the uncertainty of the wheat crop, is this year frequently explained on another ground. The fear is expressed by intelligent farmers that the present low prices of wheat are not due to temporary causes, but to a large and probably permanent increase in the area of the wheat field of the world, by which a new adjustment of food values will be brought about. This impression, whether it prove to be well-founded or not, will in the meantime have a certain effect in proportioning the attention devoted to particular branches of agricultural industry of the Province.

With regard to the relations existing between the farmer and farm servants, though they are generally reported to be satisfactory, it is frequently stated that wages in the summer season are proportionately too high, as there is little or nothing for farm labourers to do in winter, and many of them, it is said, expect to make as much during the five or six months of the busy season as will keep them in comparative idleness for the rest of the year. Another evil which is attributed to the same cause is that, as one correspondent says, "the labourer becomes a migratory sort of being," between whom and his employer there is little sense of mutual responsibility, owing to the brief period of their relationship. Several farmers suggest the advisability of building more cottages on their farms and employing married men by the year; and should stock-farming become more general in the Province, though the total number of hands required may be less, engagements of this kind are more likely to be made. As already stated, the relations between master and servant are very generally said to be quite satisfactory. There are, however, some complaints on the part of farmers that the servant is more independent than the "boss," that he does "only what he likes," that "men will not work unless they are under the master's eye," that "the law is too favourable to the labourer," and so on. Such complaints will probably be made to the end of time, or at all events so long as the relationship of master and servant continues; but as they are after all comparatively few in number, as only one side of the question is heard from, and as, moreover, other correspondents state that so long as masters treat their servants fairly, and, as one of them puts it, "don't expect two days' work in one," their relations remain all that could reasonably be desired, the replies on that point can hardly be regarded as proving any general unsatisfactoriness in the relationship existing between the two classes. The migratory character of farm servants, which has already been referred to, and which is at present almost unavoidable, has no doubt a good deal to do in causing these complaints.

Upon one other point in the labour question there is practically but one reply from the six hundred correspondents who have reported on the subject—that is, the question of domestic servants. "Very scarce," "cannot be had for love or money," is the report made all but universally. Only a few of the correspondents deal with the cause of this condition of things, and their opinion is, in brief, that it is due to the tendency of girls to resort to towns and cities, and engage in sewing and other like pursuits, and the aversion which farmers' daughters of the poorer class feel to engaging in domestic service from a notion that it is less "respectable" than some other wage-earning occupations. Whatever the cause, however, there is no doubt of the increasing scarcity of this class, and none of the correspondents of the Bureau suggest a remedy, unless it be "to do without them"—or to procure labour-saving implements for the house as well as for the farm.

The following table gives the average wages of farm hands and domestic servants for the two years 1883 and 1884, as computed from the June returns of farmers:

Districts.	Farm Hands.								Domestics.	
	Per year.				Per month.				Per week.	
	With board		Without board.		With board.		Without board.		With board.	
	1884.	1883.	1884.	1883.	1884.	1884.	1884.	1883.	1884.	1883.
	$	$	$	$	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Lake Erie	162	174	253	260	18 83	20 01	28 13	29 13	1 50	1 52
Lake Huron	169	176	257	276	19 73	21 05	29 72	30 85	1 49	1 51
Georgian Bay	165	168	260	262	19 66	20 30	29 92	30 08	1 47	1 45
West Midland	167	173	256	263	19 58	19 94	28 94	30 10	1 52	1 53
Lake Ontario	168	173	256	262	18 95	19 78	28 65	29 67	1 52	1 56
St. Lawrence & Ottawa	170	172	258	257	19 99	20 85	29 35	30 38	1 53	1 50
East Midland	171	175	256	268	19 03	20 63	29 10	30 97	1 53	1 50
Northern Districts	182	198	287	309	21 21	23 33	31 19	34 54	1 49	1 44
The Province	167	173	257	264	19 44	20 37	29 11	30 21	1 51	1 52

FROM THE MAY REPORT.

F. A. Nelles, Seneca, Haldimand: There are a number of boys in this section from the Farm Home farm, 14 to 17 years of age, who started the first year at $4 per month. They have all given good satisfaction, and will get a good advance in wages for their second year.

Wm. Mowbray, Sarnia, Lambton: Our great want is help in haying and harvesting. It is scarce and expensive—say $30 per month, with board.

John Beattie, McKillop, Huron: There is a sufficient supply of farm labourers. A few immigrants have been sent here, but this is a great mistake, as the labouring class that belong to this locality have considerable difficulty in finding employment at this season of the year.

Robert McCutcheon, Sydenham, Grey: I think there is no better part of Ontario for immigrants of the farming class to come to than this, and yet we scarcely see any of them come here. They would get good wages in the summer, and work in the winter, but at low wages.

George Leverrage, Fullarton, Perth: Farm labour is very scarce, and altogether too high, which necessitates farmers economizing in this direction.

Robert A. Reed, Erin, Wellington: Some good farm labourers from the Old Country, who would be willing to work for say $12 or $14 per month and board, by the year, would, I think, soon get employment in this section of country.

R. R. Mowbray, Pickering, Ontario: Respecting farm labourers, we want more good men, but do not want men that are unaccustomed to farming. A great many are not able, and many are too lazy to work. In our neighbourhood a dozen good men could find employment the year round.

W. D. White, Medora and Wood, Muskoka: Wages are kept up by river driving, and farmers cannot afford to hire, and so are hindered from clearing the land rapidly; and those who are too lazy to go on the drives will not work at clearing land.

D. Patterson, McKellar, Muskoka: A few Old Country men who are used to farm work would get employment here. Canadians who hire generally go at the lumbering.

FROM THE AUGUST REPORT.

W. G. Morse, Mersea, Essex: In regard to labour, I might say the local supply is far above the demand; many of our best men can hardly get employment one-half of the time, and many more are idle most of the time. All kinds of work seem to be almost at a standstill.

John Dickie, Colchester South, Essex: This county is differently situated with regard to labour supply from the greater part of Ontario. There is a large population of French and coloured citizens, the greater number of whom own small farms of from five to fifty acres. The male members of these families work out during the harvest and other busy seasons, so there is never a scarcity of male help. The greatest difficulty here is to get trustworthy females as servants. The females of the French

families are all engaged in knitting or straw-plaiting, and as a rule will not go out as domestic servants. The best of the coloured girls go to Detroit, where they get higher wages, and employment better suited to their peculiar idiosyncrasies.

John Bishop, Orford, Kent : Hands were scarce all through haying, or rather would not take what was offered, viz., $1 per day, demanding $70 for two months, or $2 per day. But self-binders and the cool weather causing grain to ripen slowly, enabled farmers to do without help, so they were glad to take $1 per day.

Robert Cumming, Harwich, Kent : The labour supply has been abundant. Three causes may be assigned : (1) Wheat ripened unevenly, which gave the farmers more time ; (2) work in towns has been scarce, consequently there were more men ; and (3) quite a number of farmers have got self-binders, thereby lessening their need for help.

W. McCredie, South Dorchester, Elgin : Owing to the amount of improved machinery now in use the farmers are more independent, and consequently wages do not go up as high as formerly.

Daniel McKillop, Aldborough, Elgin : Times are rather dull, markets are low, and no demand for cattle, consequently labour is not so high this year.

B. Kilmaster, Walsingham, Norfolk : Quite a number of self-binders bought this season, so it makes labour plenty.

Joseph Mumby, Moulton, Haldimand : Self-binders, hay forks and loaders, do away with labour strikes.

S. H. VanEvery, Pelham, Welland : Self-binders are beginning to be used, and are making quite a difference in labour.

J. Dallas, Bosanquet, Lambton : It is your correspondent's humble opinion that there are enough able-bodied men in the country to do all the work without importing any, if they could be induced to take a fair day's pay for a fair day's work.

Joseph H. Patterson, Dawn, Lambton : Good hands generally have work at fair wages. Discontented immigrants who want big pay and little work are not in demand in this township.

D. S. Robertson, Plympton, Lambton : Self-binding machines are being introduced by some, and others are making more enquiries about them than usual. In a few years they will to a great extent supersede the present reapers.

G. Edwin Cresswell, Tuckersmith, Huron : Owing to the large use of labour-saving implements, such as the mower, the horse rake, the hay fork, etc., for the hay crop, and the binder for grain, no difficulty is experienced in procuring harvest hands, and the rate of wages is kept within reasonable bounds.

Robert Russell, Greenock, Bruce : Owing to the light crop few labourers are required.

John Douglas, Arran, Bruce : The greatest trouble is the want of skill in the hands that you do get—not at all as it used to be. Men who know comparatively little of farm work look for high wages.

Robert Lawrence, West Gwillimbury, Simcoe : Self-binders doing all the work, leaving labourers to do something else, therefore reducing wages a little.

Henry Anderson, Westminster, Middlesex : I have heard of immigrants not being able to get work ; with machinery few hands are sufficient.

Alfred Kitchen, South Dumfries, Brant : The labour supply has been more plentiful than for the last few years, on account of so many self-binders, and the wages have been very reasonable.

John Smith, jr., Blandford, Oxford : Self-binding harvesters are coming into general use, and these are beginning to be felt on the labour supply.

George Ballachey, jr., Brantford, Brant : There is plenty of room for more *good* farm hands and stock men, and as for female help it cannot be had for love or money.

Thomas Page, Wallace, Perth : Self-binders have come into use this year for the first time.

J. B. Snyder, Woolwich, Waterloo : Labour supply ample, as many farmers have binders.

Robert Gray, Mulmur, Dufferin : Female help is very scarce at about $6 per month.

Hugh McDougall, East Luther, Dufferin : Labour plentiful.

William McDonald, Esquesing, Halton : There seems to be plenty of men wanting to hire, but they hold out for such high wages that quite a number of the farmers are getting self-binders rather than hire them.

D. James, Markham, York : Wages higher earlier in the season than at present. Never saw so many looking for work in harvest for several years.

A. Foster, Markham, York : Had it not been for the many excellent cord-binders sold and used in this part of Markham, hands would have been scarce.

Thomas Cain, Scott, Ontario : Self-binders are with many farmers supplying the place of hired help, and men are not much in demand just now. They are asking more than a farmer is able to give—say from $30 to $40 a month, with board, washing and mending.

Robert Colville, Clarke, Durham : In consequence of a rush of self-binding reaping machines into this locality it lessens the demand for harvest labour.

William A. Webster, Leeds and Lansdowne, Leeds: I don't hear the word wages mentioned. With our improved machinery we are doing our own work, and doing it well.

A. Hawkins, Eldon, Victoria: Labour plentiful, on account, to a large extent, of the introduction of self-binders. Those who last year had two, three and four men, now do with one.

D. Kennedy, Otonabee, Peterborough: The large number of binders which have come into the country has made harvest hands plenty.

D. McFarlane, Foley, Parry Sound: This is the first season that mowers have been introduced, which makes the labour supply sufficient.

D. Patterson, McKellar, Parry Sound: Splendid chances for old country farm labourers.

FROM THE NOVEMBER REPORT.

Robert Manery, Mersea, Essex: The reason wages must fall is that farm produce being so low in price farmers will not hire, and if they do wages must correspond with the prices of farm produce.

James Macfarlane, Raleigh, Kent: The supply of domestic servants is always limited hereabouts. Dwelling houses for married labourers are much wanted.

C. Darling, Howard, Kent: I think wages are likely to fall on account of the low prices of produce, and the introduction of self-binders, which relieves farmers of the dread of being unable to get the wheat and oat crop speedily in.

Robert Cumming, Harwich, Kent: If produce remains low in price farm labourers must accept lower wages. Wheat at seventy cents, corn at thirty cents, beans at eighty-five cents, and wages at from twenty to twenty-two dollars per month and board, are not in proportion.

Francis Gifford, Camden, Kent: Wages will fall in all probability, owing to non-migration to the North-West and general depression.

John L. Sherk, South Dorchester, Elgin: Men were hunting for work this harvest. I think there is not difference enough made in men's wages; a good man receives fair wages, and a poor hand expects the same, and the farmer has to work hard himself to help the poor hand to earn his salary.

James Davidson, Yarmouth, Elgin: More cottages wanted for married labourers.

J. H. Houser, Canborough, Haldimand: The farmers are well supplied with working machinery; many self-binders were introduced last season.

James McClive, Bertie, Welland: Binding machines are pretty fully introduced, and also single furrow sulky ploughs. All give promise of good work, and the investment paying a fair interest in use. Domestic servants fearfully scarce and wages high.

S. H. VanEvery, Pelham, Welland: The farmer's hired man is the only person who has ready money; farm wages require to be reduced.

E. A. Dickout, Bertie, Welland: The supply of domestic servants limited; good ones hardly obtainable at any price.

Martin Watson, Bosanquet, Lambton: Wages will probably fall, as food is cheap and farm products are scarcely remunerative. There is a very great deficiency of domestic servants. Respectable and well to do families are entirely without them, and will do without them unless they can get good girls who respect themselves and understand their duties.

S. Dallas, Bosanquet, Lambton: Wages not likely to rise owing to the price of produce being low, and the introduction of labour-saving machines, such as self-binders, hay-forks and hay-loaders.

J. B. Hobbs, Warwick, Lambton: Farm labourers are abundant. Wages must fall in proportion to the fall in grain, live stock, etc. One half will be out of employment this winter.

John Anderson, Turnberry, Huron: Wages not likely to rise as there are no public works going on. But a good deal of wood will likely be cut this year, as grain prices are very low.

John Hannah, Tuckersmith, Huron: If any change in wages there will be a fall, as the lumbering in Michigan is dull.

James Campbell, Stanley, Huron: There is not so much demand for farm-hands, as there are a good many self-binders and labour-saving machines, and fine weather to do the work. Wages likely to fall equal to other things. Lots of domestic servants to marry—none to hire.

John McMillan, Hullett, Huron: Wages are likely to fall. More binders, hay-loaders and machines generally used, and farm produce being cheap, farmers are grazing more and cultivating less.

Hugh Murray, Bruce, Bruce: Wages more likely to fall. American lumber camps are dull, so that few will go there for the winter as they usually do.

John Herriot, Elderslie, Bruce: Wages are likely to fall owing to the low price of grain, and farmers are going more into cattle-raising. Domestic servants scarce.

Thomas Shipley, East Williams, Middlesex: Wages will rise, because many are leaving for the North-West.

R. Coad, Ekfrid, Middlesex: Wages are tending downwards, the result of low prices of produce. I think that if more married men were employed by farmers it would be better.

W. Sutherland, Ekfrid, Middlesex: Domestic servants not very plenty, as the high wages in Detroit interfere.

Henry Gough, Metcalfe, Middlesex: Wages will fall—there is a surplus of labourers.

Caverhill Bros., Lobo, Middlesex: Wages likely to fall, for produce is low and money scarce. Farmers are doing nothing more than is absolutely necessary for the carrying on of their business. The supply exceeds the demand.

Peter Stewart, West Williams, Middlesex: As the demand for lumbermen is small our labouring men will be at home, and work at home is likely to be of less extent than last year.

J. Smith, jr., Blandford, Oxford: Low prices and improved machinery are not likely to produce a rise, but other causes—first amongst them, new territory to occupy—will likely prevent much of a fall in wages. I expect they will rule a little lower next season. The relations between good bosses and good servants are satisfactory.

Thomas A. Good, Brantford, Brant: There are not near enough domestic servants. Fully twice as many could find employment.

W. B. Freeborn, Mornington, Perth: Wages are likely to fall, as farmers generally will be getting self-binders, which will enable them to take off their harvest with less help; and a great many farmers formerly hired a man for six or seven months principally to have him secured for the harvest.

T. McCrae, Guelph, Wellington: Wages about stationary—if anything, they incline to fall, as a good many unemployed of second-class are offering.

Wm. Whitelaw, Guelph, Wellington: Supply of domestic servants not equal to demand. In fact good servant girls can scarcely be got.

Robert Hayward, Arthur, Wellington: More improvements would be made in this township if labourers were more plentiful.

J. Hickling, Artemesia and Osprey, Grey: The supply of farm labourers was not equal to the demand until the last few days, when some immigrants came in of the better class—good farm hands. I applied to an immigrant agent and got two first-class young men.

Andrew Grier, Collingwood, Grey: The rate of wages is likely to fall on account of a number of our young men returning from Manitoba and the North-West. Girls for housework are very scarce.

Robert Oliver, Artemesia, Grey: Wages are likely to fall, owing to low prices of grain, etc. The farmers find it more profitable to raise stock, engage in dairying, etc., than to pay high wages for working so much land.

W. D. Anderson, Nottawasaga and Mulmur, Simcoe and Dufferin: Farmers and servants do not get along as they should. The farmers try to get too much work out of the men, and the men watch the farmers' necessity and drive hard bargains for big pay. To remedy this evil farmers must build comfortable tenement houses and employ more married men, paying fair wages per annum.

John Blasdell, Beverley, Wentworth: The abundant immigration of farm hands is likely to lead to a fall of wages.

Daniel McLaren, Nelson, Halton: Wages are likely to be lower because the supply has overtaken the demand, and our staple crops, wheat and barley, are likely to be lower in future.

Archibald McKinnon, Caledon, Peel: Binders lowered wages fifty per cent. when put in the field.

Wm. Kersey, Toronto Gore, Peel: There is too much grain grown in this locality, which leaves no work in the winter season, and makes the farm servant a kind of migratory being, which is not very satisfactory.

W. J. Dods, Caledon, Peel: For short terms in summer the binders cut down wages and the number of men; but very little change in men for the whole summer.

Joseph D. Davidson, North Gwillimbury, York: Wages in harvest will not, I think, be as high as they have been, as the number of self-binders now in use lessens the amount of help required to a great extent.

F. C. Sibbald, M.D., Georgina, York: Wages likely to fall; supply greater than demand; many have returned from the North-West, and owing to the shutting down of the mills many have returned from the lumbering districts in Ontario and Michigan.

N. A. Malloy, Vaughan, York: Wages are likely to fall, owing to the extensive use of labour-saving machinery and the present low prices of grain.

J. D. Evans, Etobicoke, York: Wages are likely to fall, owing to the increased use of machinery and the large immigration into the township.

D. James, Markham, York: On account of the low price of produce, farmers won't pay the former wages to labourers, but will use labour-saving machinery and seed to grass. The time is coming when farm hands will have to board themselves. The supply of domestic servants is miserable. A change must take place in this respect, or farmers will have to quit farming unless they have a family of girls.

A. Forster, Markham, York : Wages are likely to fall, on account of the self-binders, the low prices of grain, and the greater attention paid to stock-raising ; but only the wages for the summer will be much affected. We want more men by the year. The self-binding machine has done more towards helping the farmer at the very time he most needs help than anything that has been introduced during the last fifty years ; we need no more hands at harvest-time than at any other part of the summer.

Thomas Cain, Scott, Ontario : Wages are likely to fall, in consequence of being excessive with wheat at seventy cents a bushel, and labourers will be supplanted by self-binders.

Robert C. Brandon, Brock, Ontario : Wages are falling. The low prices, both for lumber and farm produce check improvement.

Wm. Windatt, Darlington, Durham : The difficulty of getting farm hands in harvest time has induced many farmers to get self-binders, which has removed the difficulty. Labourers would rather be idle than work for reduced wages. Domestic servants always in demand.

James Parr, Cartwright, Durham : The rate of wages must fall if the low price of grain continues. The relations of farmer and servant are not satisfactory in this locality, as farm hands expect to obtain as much money for six months' labour as the farmer can afford to pay for twelve, and go idle the remaining six months of the year.

E. J. Honey, Percy, Northumberland : Domestic servants are very scarce.

F. Bonnycastle, Seymour, Northumberland : Wages of farm labourers likely to fall, on account of low wages in the shanties.

George Lott, Richmond, Lennox : Wages are likely to fall, as the labour produced by the construction of railroads and other public works has ceased.

Leonard Wager, Sheffield, Addington : Wages likely to rise. Hands are all going to the lumber woods.

B. Tett, Bedford, Frontenac : The wages of farm labourers are likely to fall. The demand for labourers in Canada and the United States appears to be dull. Domestic servants, as a rule, are hard to get. They do not care to work for farmers, as the wages are low and the work hard.

Dr. Elkington, Palmerston and Canonto, Frontenac : Our girls are drained off by boarding-houses, villages and distant towns.

D. McDearmid, M.D., Kenyon, Glengarry : Great difficulty in securing servant girls. Those who go to service find employment in the cities and in the State of New York.

James Clark, Kenyon, Glengarry : Wages are likely to fall. Lumbering is very slack this fall, and a great many have returned from the States, not being able to obtain employment.

W. J. Summerby, Russell, Russell : We have very few farm servants. Our farmers generally, by the aid of machinery, do their own work.

Neil Stewart, Goulbourn, Carlton : With binders, mowers and horse rakes, we are not in need of hired hands.

Edmund Anderson, Lanark, Lanark : Farm machinery has reduced the need for much hired help. I think wages are likely to fall on account of dulness in the timber market.

John S. Hart, Drummond, Lanark : Domestic servants are very scarce and in great demand in towns and villages at from $5 to $10 per month.

A. Smallfield, Horton, etc., Renfrew : Wages are likely to fall on account of the low prices of produce, and also because by the completion of railway construction in this neighbourhood the supply of labourers will probably exceed the demand.

Robert McLaren, Horton, Renfrew : Servant girls of the right stamp are very scarce.

John Stewart, McNab, Renfrew : Wages will fall, as the timber trade, which employs a great many in the Ottawa valley, is dull, and some of the railways are nearing completion, and will throw many men upon the farm.

A. Schultz, Sebastopol, Renfrew : Wages likely to be high so long as work on the C. P. R. continues.

F. Kosmark, Admaston, Renfrew : Wages are not likely to rise, the district having had a fair share of excellent German immigrants : besides, the Kingston and Pembroke Railway being nearly completed will probably discharge a great many men.

Thomas H. Blanchard, Sidney, Hastings : Wages are likely to fall, because the business will not afford such wages as have been paid in previous years, as well as because of the introduction of machinery.

Wm. Hilton, Marmora, Hastings : No domestic servants to be had.

John H. Delamere, Minden, Haliburton : Wages are lower here, owing to the great reduction in lumbermen's wages, which govern this locality.

Charles R. Stewart, Dysart, Haliburton : Wages will probably fall, by reason of so little lumbering.

D. Kennedy, Otonabee, Peterborough : Wages are likely to fall, as many farmers are curtailing their acreage of grain ; also owing to the number of machines now used.

William Ramsey, Mariposa, Victoria: Wages are likely to fall, because the farmers are getting self-binders. Domestic servants are rather scarce.

Nelson Heaslip, Bexley, Victoria: The tendency of wages is to fall; reports from a distance have that bearing, and the demand for the lumber shanties is not so pressing as in former years.

W. H. Green, Sinclair, Muskoka: Wages will rise about the first of April, as we are having a railway built, and will get good prices for our produce, and will want hands to clear more land.

James Early, Chaffey, Muskoka: Wages are likely to come down this winter, there are so many Italians in this district working on the railway.

D. Macfarlane, Foley, Parry Sound: The rate of wages will fall; lumbering is dull, and we are ruled by it.

John Young, Armour, Parry Sound: Farm labour at present is not very plentiful, owing to the construction of the railway, and wages are likely to keep up.

STATISTICS OF THE WAGE-EARNING CLASSES.

The tables of Labour and Wages (XXIII.—XXVII.) present the statistics of the wage-earning classes in the chief industrial centres of the Province. There are two classes of statistics, showing (1) the average wages of workpeople in the various occupations and sub-occupations, based on returns collected from employees and employers for the last week of April and the last week of October; and (2) the average time, earnings and cost of living of workpeople for the year ending 31st of October, based on returns collected from themselves.

The system adopted was to make a personal canvass of employers and employees, and obtain actual figures from each where these could be given and where the parties were willing to communicate them. The returns from employees were collected by local agents in each town or city, while those from employers (saving in Kingston and Brockville) were collected by Mr. Leckie, assistant secretary of the Bureau. There is reason to believe that in this way accurate and reliable information has been obtained, and the parties canvassed have as a rule given the returns willingly and with a due appreciation of the value of statistics of the working classes.

The instructions to collectors are contained in the following circular, issued on the 25th of November:

INSTRUCTIONS TO THE COLLECTORS OF LABOUR STATISTICS.

The annexed list of trades and occupations will inform you in a general way of the classes of workingmen from whom it is desirable to procure Labour Statistics, but should there be any other important ones in your town they may be included also.

Two distinct Forms or Schedules are supplied, and as far as possible the information called for by each should be obtained from every workingman who gives returns.

The first Form, or Schedule A, asks for—

1. Name of the workingman or woman.
2. Whether over or under 16 years of age.
3. In what establishment employed.
4. Class of occupation, or sub-occupation.
5. Amount of wages earned in the week ending April 26th, and in the week ending October 25th of this year, being the last full week in each month.
6. The number of days employed in each week.
7. The number of hours employed in each week.

The interval of six months will serve to show whether in that period wages have risen or fallen, or remained stationary. It is also proposed to obtain similar information from the employers of labour.

The second Form, or Schedule B, asks for—

1. Name of workingman or woman.
2. Whether over or under 16 years of age.
3. In what establishment employed.
4. Class of occupation, or sub-occupation.
5. Number of persons depending for support (not including the workingman).
6. Number of hours per day each workman is employed in his occupation.
7. Number of hours per week he is so employed.
8. Number of days each workingman was employed during the year beginning 1st November, 1883, and ending 31st October, 1884.
9. Amount of wages derived by each workingman from his occupation for the said year.
10. Amount of extra earnings (if any) received during the said year by each workingman outside of his regular occupation.
11. Amount of earnings (if any) of wife or minor children of each workingman during the said year.
12. Cost of supporting each member's family (or himself if he have no dependents) for the said year.

The Collector will doubtless frequently meet with cases where it is difficult to obtain from the workingman all the particulars asked for in the schedules, and in such cases a little judicious help or suggestion on the Collector's part may be necessary. The experience of persons employed in this service by the Massachusett's Bureau of Labour Statistics is that, even with workingmen who keep no record of time, wages, or cost of living, a few well-directed questions will enable the workingman to give figures that are as nearly as possible accurate.

If the workingman is unable for any cause to supply the information when called upon, his address should be taken, one copy of each schedule left with him, and a call made at his residence after working hours. In some cases it may be expedient to do this so as not to interrupt his operations ; and in order that no cause of offence may be given to the employers of labour in factories, or elsewhere, it will be prudent to consult them and obtain their assent before commencing a canvass of the employees.

I need not urge upon the Collectors the great importance of accuracy in gathering these statistics. The economic value of the information depends wholly upon its accuracy, and in the interest alike of employers and employees it is desirable to ascertain the truth with respect to the condition of the wage-earners of the country.

Collectors are requested to make a daily return to the Bureau of the schedules they have filled up, so that their work may be examined as it proceeds and attention called to defects or inaccuracies in it, if any should appear. The enclosed envelopes may be used in mailing these returns. They are postage free, if not sealed ; but if sealed and pre-paid with a view to secrecy, the postage will be refunded to the Collector by the Bureau.

A short report on the state of the labour market during the year will be very acceptable, but it should be prepared with great care, and with a strict regard to facts. I would suggest a reference to such subjects as employment in the various trades and occupations ; the number of persons out of employment (if any), for what time and for what cause ; the extent to which immigration and emigration have affected labour and wages ; how often wages are paid to workingmen and whether they are paid in money or goods ; the relations of employers and employees, etc.

It is distinctly understood that the statistics called for in the schedules will be treated as confidential by the Bureau. They will be published only in bulk form, and cannot be used for any purpose of assessment or taxation. Still, if any workingman objects to giving his name with the statistics of his schedule, the Collector may accept it on that condition by certifying that it is a genuine return.

A. BLUE, *Secretary.*

OCCUPATIONS OF WAGE-EARNERS FROM WHOM STATISTICS OF LABOUR AND WAGES WILL BE COLLECTED.

Agricultural Implement maker :
- Machinist.
- Woodworker.
- Blacksmith.
- Moulder.
- Painter.
- Labourer or helper.

Baker.
Beer maker.
Billiard table maker.
Blacking maker.
Boat builder.
Boiler maker.
Bolt cutter.
Bolt header.
Bolt maker.
Book binder.
Book cutter.
Book folder.
Book gilder.
Book sewer.
Brass and Copper Tube maker.
Brass finisher.
Brass moulder.
Brass turner.
Brass worker.
Brick mason.
Britannia Ware maker.
Broom maker.
Brush maker.
Butcher.
Button maker.
Cabinet maker.
Car builder.
Cable Wire maker.
Carpenter (house).
Carpenter (ship).
Carpet factory operative :
- Cutter.
- Finisher.
- Pattern changer.
- Rug weaver.
- Setter.
- Sewer.
- Weaver.
- Winder.

Carpet upholsterer.
Carriage blacksmith.
Carriage maker.

OCCUPATIONS OF WAGE-WORKERS, &c.—*Continued.*

- Carriage trimmer.
- Carriage stitcher.
- Chair factory operative :
  - Back finisher.
  - Cane seater.
  - Finisher.
  - Ornamenter.
  - Turner.
  - Sawyer.
- Cigar maker.
- Cigar packer.
- Cloak maker.
- Coal heaver.
- Common labourer.
- Confectioner.
- Coppersmith.
- Copyist.
- Corset maker :
  - Cutter.
  - Finisher.
  - Lacing-braider.
  - Presser.
  - Stitcher.
- Cotton factory operative :
  - Beamer.
  - Braider.
  - Carder.
  - Card grinder.
  - Card stripper.
  - Cloth finisher.
  - Cloth inspector.
  - Cloth marker.
  - Dresser.
  - Dyer.
  - Folder.
  - Filling assorter.
  - Lapper tender.
  - Loom fixer.
  - Mule spinner.
  - Packer.
  - Picker tender.
  - Quilter.
  - Section hand.
  - Slasher tender.
  - Speeder tender.
  - Spinner.
  - Spooler.
  - Trimmer.
  - Twister.
  - Warper.
  - Weaver.
  - Web drawer.
  - Winder.
- Currier :
  - Beamster.
  - Dresser.
  - Finisher.
  - Measurer.
  - Scourer.
  - Splitter.
  - Stuffer.
  - Table man.
- Distiller.
- Domestic Servant.
- Earthenware maker.
- Edge Tool maker:
  - Finisher.
  - Forger.
  - Grinder.
  - Temperer.
- Electro plater.
- Electrotyper.
- Electrotype finisher.
- Engineer (marine).
- Engineer (stationary).
- Engineer (steam fire).
- Envelope cutter.
- Envelope maker.
- File maker.
  - Cutter.
  - Forger.
  - Grinder.
  - Layer.
- Fireman (marine).
- Foundryman.
  - Assorter.
  - Core maker.
  - Dresser.
  - Foreman.
  - Furnace man.
  - Grinder.
  - Heater.
  - Helper.
  - Hollow-ware dresser.
  - Iron polisher.
  - Melter.
  - Moulder.
  - Puddler.
  - Stove mounter.
- Fur cutter.
- Fur dresser.
- Fur sewer.
- Fur tanner.
- Furniture maker :
  - Finisher.
  - Repairer.
  - Trimmer.
  - Varnisher.
- Glass factory operative :
  - Blower.
  - Burnisher.
  - Cutter.
  - Designer.
  - Engraver.
  - Flattener.
  - Ornamenter.
  - Packer.
  - Polisher.
  - Presser.
  - Shearer.
  - Stoppleman.
- Glazier.
- Grist mill operative.
- Gunpowder maker.
- Harness maker.
- Hatter :
  - Binder.
  - Bleacher.
  - Hardener.
  - Finisher.
  - Presser.
- Hatter.—*Continued.*
  - Washer.
- Horseshoer.
- Hosiery mill operative :
  - Cutter.
  - Finisher.
  - Folder.
  - Knitter.
  - Mender.
  - Presser.
  - Roller.
  - Spinner.
  - Stitcher.
  - Trimmer.
  - Weaver.
  - Winder.
- Iron worker :
  - Fireman.
  - Forger.
  - Hammersmith.
  - Rail cutter.
  - Rivet maker.
  - Roller.
  - Scaler.
  - Shingler.
  - Steel cutter.
- Jewelry maker :
  - Chaser.
  - Foreman.
  - Polisher.
- Lamp lighter.
- Lather.
- Lime burner.
- Lumber mill operative :
  - Jointer.
  - Planer.
  - Sawyer.
- Machinist.
- Marble worker.
  - Finisher.
  - Foreman.
  - Polisher.
- Mariner.
- Mason.
- Mechanic.
- Miller.
- Millwright.
- Milliner.
- Miner.
- Moulding maker.
- Organ factory operative:
  - Action maker.
  - Bellows maker.
  - Case maker.
  - Finisher.
  - Keyboard maker.
  - Key maker.
  - Key polisher.
  - Pipe maker.
  - Reed-board maker.
  - Reed maker.
  - Shaft maker.
  - Spring maker.
  - Stop maker.
  - Tuner.
- Painter (house).
- Painter (ornamental).
- Paper mill operative :
  - Assorter.
  - Bleacher.
  - Boiler tender.
  - Calenderer.
  - Counter.
  - Cutter tender.
  - Dyer.
  - Finisher.
  - Folder.
  - Foreman.
  - Machine tender.
  - Packer.
  - Pulp maker.
  - Rag cutter.
  - Ruler.
  - Sealer.
  - Size maker.
- Paper hanger.
- Photographist.
- Photograph printer.
- Piano maker :
  - Action maker.
  - Case maker.
  - Finisher.
  - Key fitter.
  - Plate driller.
  - Polisher.
  - Regulator.
  - Sounding board maker
  - Stringer.
  - Top maker.
  - Trimmer.
  - Tuner.
  - Varnisher.
  - Veneerer.
- Picture frame gilder.
- Picture frame maker.
- Picture frame varnisher.
- Planing mill operative.
- Plasterer.
- Plumber.
- Pork packer.
- Printer :
  - Compositor.
  - Foreman.
  - Press feeder.
  - Pressman.
- Proof reader.
- Pump maker.
- Quarryman.
- Railroad employee (steam) :
  - Baggage master.
  - Brakeman.
  - Car inspector.
  - Checkman.
  - Engineer.
  - Engine wiper.
  - Flagman.
  - Fireman.
  - Freight agent.
  - Freight conductor.
  - Freight master.

OCCUPATIONS OF WAGE-WORKERS, &c.—*Continued.*

- Railroad employee (steam)—*Con.*
  - Gate tender.
  - Labourer.
  - Section master.
  - Signal tender.
  - Station agent.
  - Switchman.
  - Trackman.
  - Watchman.
- Railroad employee (horse):
  - Conductor.
  - Driver.
- Rattan worker:
  - Basket weaver.
  - Chair maker.
  - Shaver.
  - Sizer.
  - Spinner.
  - Splitter.
  - Washer.
  - Weaver.
- Reporter.
- Rope maker.
- Rope factory operative:
  - Hemp dresser.
  - Spinner.
- Rubber factory operative
- Saddler.
- Safe maker.
- Sash, door and blind maker.
- Sausage maker.
- Sawyer.
- Scale maker.
- Seamstress.
- Sewing machine maker.
- Sewing machine operator
- Shirt maker.
- Shoemaker:
  - Beater out.
  - Binder.
  - Blocker.
  - Buffer.
  - Burnisher.
  - Button hole maker.
  - Channeller.
  - Clamper.
  - Closer.
  - Corder.
  - Crimper.
  - Cutter.
  - Dresser.
  - Edge maker.
  - Eyeleter.
  - Finisher.
  - Fitter.
  - Foreman.
  - Heeler.
  - Insole maker.
  - Lacer.
  - Laster.
  - Leveller.
  - Machine operator.
  - Nailer.
  - Packer.
  - Paster.
  - Riveter.
  - Roller.
  - Sandpaperer.
  - Shank presser.
  - Sider.
  - Sole assorter.
  - Sole leather cutter.
  - Stitcher.
  - Stock fitter.
  - Stripper.
  - Treer.
  - Trimmer.
- Shoemaker (*continued*):
  - Turner.
  - Vamper.
  - Welter.
- Show case maker.
- Silver and nickel plater.
- Soap maker.
- Spring maker.
- Stair builder.
- Steam and gas fitter.
- Stereotype caster.
- Stereotype finisher.
- Stone cutter.
- Stone mason.
- Tailor:
  - Cutter.
  - Pressman.
  - Trimmer.
- Tailoress.
- Tanner.
- Teamster.
- Telegraph operator.
- Telegraph repairer.
- Time keeper.
- Tobacco stripper.
- Tinsmith.
- Tool maker.
- Upholsterer.
- Vinegar maker.
- Wire factory operative:
  - Annealer.
  - Cleaner.
  - Cooler.
  - Drawer.
  - Finisher.
  - Plater.
  - Pointer.
  - Straightener.
  - Temperer.
  - Weaver.
- Wood chopper.
- Wood worker.
- Woodenware maker.
- Woollen factory operative:
  - Assorter.
  - Burler.
  - Card cleaner.
  - Carder.
  - Colourer.
  - Comber.
  - Drawer-in.
  - Dresser.
  - Drum tender.
  - Dyer.
  - Felter.
  - Finisher.
  - Foremen.
  - Fuller.
  - Gigger.
  - Jack spinner.
  - Loom fixer.
  - Napper.
  - Oiler.
  - Overseer.
  - Picker tender.
  - Presser.
  - Reeler.
  - Repairer.
  - Scourer.
  - Shawl fringer.
  - Shearer.
  - Specker.
  - Spinner.
  - Spooler.
  - Stitcher.
  - Teasel setter.
  - Twister.
  - Warper.
  - Weaver.

The schedule used in collecting wage statistics from the employers of labour was similar in form to Schedule A, used by Collectors of the statistics of employees; and a comparison of the returns obtained from the two sources shows that as nearly as possible actual figures have been given. Following is the comparison from the two sources of information:

	Employees' returns.		Employers' returns.
Average wages for April week	$8.35	.....	$7.90
Average wages for October week	8.14	.....	7.81
Average wages for both weeks	8.24	.....	7.85
Average hours' work for April week	57.92	.....	57.00
Average hours' work for October week	57.17	.....	55.54
Average hours for both weeks	57.55	.....	56.27
Average wages per hour for April week.....(cents)	14.42	.....	13.86
Average wages per hour for October week ..... "	14.24	.....	14.06
Average wages per hour for both weeks ..... "	14.32	.....	13.95

The slight excess in wages and time as shown by the returns of employees is no doubt accounted for by the smaller proportion of returns for females and for workers under sixteen years of age. Thus, of the 19,602 persons for whom returns were given by

employers, 15 per cent. were females and 10 per cent. were males and females under sixteen; whereas of the 2,831 employees who gave returns only 8.94 per cent. were females and only 0.85 per cent. were males and females under sixteen. It may therefore be fairly assumed that correct figures were procured from both sources, and that the average rate of weekly wages as given in Table No. XXIV. is a true rate for the towns and cities to which it relates.

The average rate of weekly wages of workpeople, as shown by the returns for the April and October weeks, was $7.90; and of the 504 occupations and sub-occupations represented in the table, the earnings of 271 were over the average, while those of 233 were under it.

Table XXV. gives the statistics of time, earnings and cost of living for 2,835 workpeople, representing 204 occupations and sub-occupations in nineteen towns and cities, for the year ending 31st October. The following analysis shows the averages of number of dependents, time employed, wages earned and cost of living for the whole number of employees, and also the number of occupations which give the figures greater or less than those of the general averages:

		No. of occupations— Over average.		Under average.
Average of dependents	3.34	25	....	151
" hours per week	59.10	109	....	95
" days per year	265.17	131	....	73
" total earnings	$383.31	126	....	78
" cost of living	$334.47	124	....	80

In 28 occupations the wage-earners had no dependents, and the total number in all occupations without dependents was 994. In 176 occupations there were 1,815 males and 44 females with dependents, and the total number of the latter was 6,212 The hours of labour show a good average, and in 88 occupations it is 60 hours per week, or over. In 15 the average is 66 hours per week, or over, and one reaches the long record of 84 hours. Street-car drivers work 81.60 hours per week, and 310.20 days in the year. In 43 occupations the average number of days employed in the year is 300, or over; and only in five of these do the employees necessarily work on Sunday, viz.: general servants, lamplighters, railway yardmen, stokers and watchmen.

Following is a summary of the totals and averages of time, earnings and cost of living of male and female employees, as appears by Table XXVI.:

Hours employed per week	168,622	....	59.10
Days employed in the year	756,523	....	265.17
Total earnings in the year	$1,093,577	....	$383.31
Cost of living for the year	$954,254	....	$334.47

Included in the total earnings is $12,337 of extra earnings by employees in 62 occupations, and $19,094 of wives' and children's earnings in 70 occupations. From these two sources the earnings of workmen in the year were increased by $31,431, or an average of $11.02.

Classified as employees with and without dependents, the totals and averages of earnings and cost of living are as follows:

	Number.	Earnings.		Cost of Living.	
		Total.	Average.	Total.	Average.
		$ c.	$ c.	$ c.	$ c.
Without dependents	994	292,440 00	294 20	228,731 00	230 11
With dependents	1,859	801,137 00	430 95	725,523 00	390 28
Totals	2,853	1,093,577 00	383 31	954,254 00	334 47

Males over 16, with and without dependents, show a total surplus of $137,624, and females a surplus of $1,898; but in the case of females with dependents the cost of living exceeds earnings by $627, or an average of $14.25 for 44 workers. Males under 16 show an average deficit of $59, and females an average of $10.77. The average surplus earnings of males and females without dependents was $64.09; with dependents, $40.67; and with and without, $48.84. Leaving out the extra earnings and the earnings of wives and children, the average surplus of all workers would be $37.82.

A further analysis of time, earnings and cost of living of workpeople for the year is presented in table No. XXVII., showing the averages by graded savings of those whose earnings were greater or less than the cost of living. The following three tables show the general results:

I.—EARNINGS GREATER THAN COST OF LIVING.

	With dependents.	Without dependents.	Total.
Number of workers	794	548	1,342
Average of—			
Days employed	280.37	275.77	278.49
Earnings	$510.95	$373.32	$454.75
Cost of living	$398.70	$251.88	$338.75
Surplus	$112.25	$121.44	$116.00

II.—EARNINGS EQUAL TO COST OF LIVING.

	With dependents.	Without dependents.	Total.
Number of workers	884	381	1,265
Average of—			
Days employed	258.78	265.47	260.80
Earnings	$385.85	$205.40	$331.50
Cost of living	$385.85	$205.40	$331.50

III.—EARNINGS LESS THAN COST OF LIVING.

	With dependents.	Without dependents.	Total.
Number of workers	181	65	246
Average of—			
Days employed	209.64	229.82	214.97
Earnings	$300.25	$147.79	$259.96
Cost of living	$374.88	$191.48	$326.42
Deficit	$74.63	$43.69	$66.46

The average number of dependents in the first class was 3.09; in the second class, 3.47; and in the third class, 3.82. It will be observed that the average number of days for which workers in the first class had employment was 278.49; in the second class, 260.80; and in the third, 214.97. The average rate of wages for workers in the first class was $1.63 per day; in the second class, $1.27; and in the third, $1.21. Had the workers of the first class received only the rate of wages of the third, they would have had a deficit of $1.77 instead of a surplus of $116; and had the workers of the third class received the rate of wages of the first they would have had a surplus of $24.40 instead of a deficit of $66.46.

The averages of the cost of living for the three classes bears a very near relation to each other, as well as to the general average. Thus, the cost of living to employees of the first class was $338.75, to those of the second class $331.50, and to those of the third class $326.42, the general average being $334.47.

The interesting reports made by the collectors of industrial statistics are given below. I have reason to believe that they were prepared with care, and with a due regard for all the interests concerned.

REPORTS OF THE COLLECTORS OF EMPLOYEES' STATISTICS.

BELLEVILLE.—According to your instructions I herewith furnish you with a short report of the state of the labour market in the City of Belleville. The number of mechanics and labourers employed in the city is a great deal smaller than for several years past. This stagnation in the labour market is especially noticeable in the woollen factories, and in the edged tool shops. The woollen factory of John Lazier, which was enlarged to double its capacity in 1872, in anticipation of a boom in that business, has been closed nearly all summer, owing to the general depression which is felt here as well as throughout the country. The factory is now in operation with a limited staff of operatives, at greatly reduced wages, as you will see by the statistics furnished. In the edged tool shop, the axe factory, wages are lower than ever before in the history of the city, and the staff of workmen about one half what it was five years ago. The labour market in Belleville has been strengthened by the establishment of a large stove foundry (removed here from Toronto), which in a measure prevents the market from becoming completely demoralized. In the summer labourers found employment on the many railways being built in the northern part of this county, but now the city is overrun by men of no mechanical knowledge who would readily accept employment at any price. In most of the factories the mechanics have been reduced to "three-quarter time," and other employers of labour will follow this example at least until spring. In a city of this size it cannot be said that immigration or emigration affects to any great extent the cost of labour, but I wish to call your attention to the growing evil which is making itself manifest here more every year, *i. e.*, the employment of young girls and boys in factories and workshops under sixteen years of age, where persons of more mature years should be engaged. It is only of late years that the mechanics have felt the effect of this practice of employing cheap labour in Belleville, and I believe the different labour organizations are taking steps to endeavour to effect a change. Here employers of labour generally pay their hands fortnightly in cash, but one or two have adopted what is known as the "order system"—giving orders on merchants for goods in part payment for wages. So far as I can learn the relations of employers and employees are of a friendly character.

C. A. ABRAHAM.

BRANTFORD.—I have found that workingmen very reluctantly give the required information, and it took considerable persuasion on my part to get any from some of them. There were those who thought that this work was only done for the purpose of imposing new burdens on them, and consequently they refused to say anything. The state of the labour market during the year was comparatively stationary, with the tendency downward during the last three months. The outside trades were all well employed and good wages paid from early spring until late in the fall, in consequence of building operations here. Buildings to the amount of $200,000 went up in that time, and carpenters, plasterers and bricklayers were busily employed. On the other hand all the shops and factories have been running on short time at different periods of the year; at the same time there have been reductions of wages from ten to fifteen per cent Immigration has not affected labour directly, but indirectly it enters into competition with agricultural implement makers, car building, and other manufacturing. The direct competition here is from the country. Machinery is so improved that it turns out all the parts of reapers, mowing machines, sulky rakes, railway cars, etc., and all that is necessary is some handy fellows who can put the pieces together and the machine is complete. So it happens that the shops are filled up with young men from the country, leaving their regular avocations and working cheap, and so they compete with other workers. At present there is more than the usual number of men out of employment. The only reason that can be given is the general depression in business. Wages are paid in money in the majority of the factories every two weeks, and at the Grand Trunk shops monthly.

During the year one firm has closed up—the Farm and Dairy Utensil Co.,—and every other factory, foundry, or manufacturing establishment, excepting the Waterous Engine Co., have been during the year working on short time or making reductions in wages. The relations of employers and employees have been on the whole friendly; no strikes or trouble that I have heard of have occurred at any of the shops or factories during the year. The returns sent from here, I think, will give a fair idea of wages paid. My aim has been to get accurate returns more than a great number of them, and their correctness may be relied on.

JOHN H. BARRY.

CORNWALL.—The last two years have been rather hard on employees at the mills. A great many French Canadians came here when they heard that the mills were paying so well, and they overstocked the market with help. They were willing to work for what they could get, and we may date the fall of wages from 1884. The other labour in mills and in town we cannot complain of so much, but outside of the mills during the winter months there is very little doing for mechanics or labourers. It consequently comes pretty hard on some who have large families, and all depending on what one can earn during the summer months. A number of the trades, such as blacksmiths, wheelwrights, saddlers, shoemakers, carriage makers, etc., are carried on by the men themselves, and very few journeymen are required.

G. M. ROBERTSON.

HAMILTON.—In my report made to the Bureau last year I brought the review of the state of labour and wages in this city down to the end of March. The gradual resumption of business in April was somewhat slow. The increase of the working staff and the extension of time employed were not so general nor so strong as had been hoped for by the advent of the spring weather which this locality enjoyed during the greater part of the month. Only in the building trades was there anything approaching a general resumption of work, and in some of these at serious reductions under the rates ruling the previous spring. Work on the new Government buildings was resumed and gave employment to many who doubtless otherwise would have remained idle. With unskilled labour there was of course considerable improvement, many finding employment in street cleaning and other corporation jobs, etc , common at this season of the year. Although many remained unemployed, there was little manifestation of a desire to move elsewhere shown, reports from other quarters not warranting such action on the part of those in search of employment, the great mass of whom very naturally preferred to remain at home rather than tramp, and, judging from the experience of those who did, they were justified in their inaction. The fears expressed of approaching trouble being imminent between employers and employees in various lines of manufacture, on account of the continued and repeated cuts in wages effected or attempted to be enforced during March and this month, were not wholly unjustified, but were perhaps wisely averted through the good spirit, firmness and moderation evinced by the operatives, which brought about, if not an amicable, still a satisfactory settlement of the disputed reduction of the weavers' wages with the manager of the Ontario Cotton Mill, under cover of a demand for an increased length in cuts or pieces woven. This and other attempts to reduce the wages of labour during the month, whether justifiable or not, were certainly in some instances enforced in a spirit of indifference to the remonstrances of the sufferers, except when remonstrance came from a strong body, united and prepared to maintain the dignity of labour at any cost. These continued and promised reductions caused a feeling of suspense to prevail, and uneasiness in a great measure took the place of the hopeful feeling before noted. The month may be summed up as very unsatisfactory for the wage-earners ; in fact the worst April in many years would not be an exaggeration of the opinion prevalent and expressed by the working people themselves.

May opened with little or no improvement apparent in the demand for labour ; indeed any increase outside the building trades was more than offset by the continued arrival of comparatively destitute immigrants assisted to this country as agricultural labourers, but many of whom were dock and shipyard labourers and general handy men. Besides the arrivals mentioned, the closing of the glass factory at an earlier date than usual set free somewhere in the neighbourhood of two hundred men and boys, besides women and girls—a circumstance that did not improve the condition in which those who labour found themselves in the opening weeks of the season. In fact painting, paperhanging and kindred occupations were almost the only ones which, even in a measure, showed that degree of activity hoped for as an outcome of the advent of warm weather during previous months of enforced idleness. There was, however, a gradual increase of the number resuming work amongst those laid off previous to last Christmas in the various manufactures of iron and other industries in metal, wood, etc. In the sewing machine trade, however, the promised increase was not apparent, but, instead, the men employed by the Gardiner Company were early in the month notified of an intended reduction, ranging from two and a half per cent., or less, to as high as thirty per cent., or more. The men refused to accept the cut, went out, and were successful in their attempt to secure a compromise in the shape of an agreement to limit the cut to ten per cent. as the highest ; but work continued only two weeks after the settlement, when they were informed of the intention to reduce the output by one-third or one-half ; and, as usual, those taking the most active stand in the late trouble, were summarily discharged. The Men's Association, looking on the desire to reduce the output at this season as a mere blind to get rid of these men, took up their cause, and correspondence between them and the firm was still going on when the month closed. Other lines of manufacture continued equally slack, and hopes of any improvement before fall were almost universally abandoned. The textile, tobacco, and other industries, instead of increasing force and working time, either reduced both, stopped operations, or threatened to stop early in the summer ; whereas steadier though less prominent industries plodded along much as usual, with some slight increase in time and force over the previous months of the year.

June found the building trades and industries connected therewith fairly employed, though not so steadily as would warrant any congratulations on the return of "good times." The employees in other industries, notably those in the service of the Grand Trunk Railway, continued on short time, and the works were shut down entirely about the middle of the month and remained so until its close, adding somewhere in the vicinity of 500 or 600 men and boys to those already spending enforced summer holidays this early in the season, and there yet remained many mechanics and others out of

employment since the previous November or December. The preparing of the streets for block paving, gave employment to labourers and others only too glad to accept such occupation, as was shown by the numbers making application, principally heads of families. Other corporation works were equally well supplied with labourers, and many had to be refused, preference being given to those with dependents. In the quarries and brickyards work was fairly steady, though not up to previous years, and much broken time was experienced by nearly every branch of industry, except in a very few lines. The continued arrival of immigrants, whose unhappy circumstances forced them to accept the merest pittance in return for their labour, did not at all decrease the feeling of discontent which had now become so general. In far too many instances it resulted in the expatriation of many good and industrious citizens, especially amongst that large and growing class of young men whose feaes of the future had kept them unencumbered, and free to go across the lines. Towards the close of the month further reductions were promised or effected in the cotton industry, and again the girls, the poorest paid of the operatives, were the principal sufferers. The green glass works shut down as usual, and when the month closed it was estimated that one third or more of the entire wage-working population were out of employment, and half of those working were only partially employed.

Little change occurred in the condition of labour during July, any increase in the demand being more than fully offset by a corresponding increase of the supply through immigration, and suspensions of operations for temporary periods. The Grand Trunk shops, however, made another start after the two weeks holiday in June, and the iron foundry and stove trades in particular showed signs of improvement as the close of the month approached. The difficulty in the sewing machine trade remained unsettled, as did the trouble in the Ontario Cotton Mill, where the girls engaged in the winding department had been reduced twenty per cent., which they had refused to accept, but which the numbers out of employment in Dundas and other centres of this industry seemed likely to force them to submit to, notwithstanding their efforts to obtain a more favourable settlement of the dispute. The building trades and many others in the same connection had reached a state of comparative stagnation, from which there seemed little likelihood of escape, only one or two jobs of any magnitude being under contract. A general feeling of depression amongst business men was also very noticeable. All hopes were turned towards the fall trade for relief from the stagnation and want of confidence so very prevalent at the close of the month, any idea of an improvement previous to that season being very generally abandoned.

During the earlier days of August the organized wage-workers held their second grand demonstration, at which all or nearly all the branches of productive industry were represented. A notable incident of this demonstration was the attendance of Mr. Henry George, who lectured on land and labour to the assembled thousands. I include this notice in the report because it must be conceded that such gatherings of the workers must have their effect on the labour of the Province, either for good or evil, and to pass it over without notice would be less than fair to those most interested, viz., the workers themselves. There was no apparent change from the unsatisfactory state in which labour was at the close of last month ; indeed it was, if anything, aggravated. The efforts made to settle the disputes noticed last month proved abortive in both instances. In the cotton trade the management gave it as sufficient excuse for their action that they had been running their mill for some months solely for the benefit of their employees, and at a positive loss to themselves, and a natural desire on the part of many of their number to cease operations entirely. Those who had gone out found their places filled by others whose circumstances made them willing to accept what the company offered. The management of the Gardiner Sewing Machine Company had absolutely refused to settle the dispute with the organization to which the men desired to refer it, and the vacant places were filled by men principally from Dundas, where the machinist trade was in a state of collapse. The men struck, and the strike was still in progress with but little change in the situation at the end of the month.

September in Hamilton, even in the worst times, usually shows at least a temporary revival in industry, brought about by the Fair season and the approach of cold weather. Increased activity was apparent in the great stove foundries, for which this place is celebrated, and improvement was noticeable in almost every other line. Steady work was more generally enjoyed, and some slight increase in force was noticeable during the month, the numbers out of employment being perceptibly decreased. The wholesale clothing trade showed improvement, as also did many other lines, and business assumed a more hopeful aspect in prospect of the fall trade proving remunerative, though caution was still the most prevalent characteristic of buyers, and shippers were equally chary about opening accounts, except with safe houses. The amount of labour employed in every branch of industry, productive and distributive, towards the close of the month was largely in excess of that employed during the two previous months, or indeed since the previous fall. The troubles noted in last month, and some minor reductions of a partial character in other industries, were engaging the attention of the organized labour. The trouble in the cotton mill was finally brought to a close by those aggrieved and the management coming to an arrangement, which, however, left the reduction in force. The chance of success for the men out in the sewing machine trade became less as the season advanced, and the number of others willing to take their places was daily augmented, so that any attempt to secure an amicable settlement became less hopeful as the season advanced.

October is, and always will continue to be, the best month in the year for labour. This year it was no exception, though still behind the same month in previous years. Still workmen were fairly employed as a rule, though the nightwork and overtime of the "boom" was not seen except in a very few instances, and only then occasionally. Most thinking people were not, however, elated by the temporary revival, being apprehensive of the probability of black times during the coming winter, notwithstanding the abundant harvest. Men of this class, therefore, were curtailing their expenses and trimming their sails so far as circumstances would allow to meet the storms of adversity that would

buffet the labourers' bark during the cold and dreary winter months of enforced idleness. The struggle between capital and labour in the sewing machine trade still continued throughout the month, with increased chances that the surplus of this class of labour would ultimately result in a failure for the men in their attempt to have their grievance recognized. Owing to the close of the Fair season and the completion of orders, the bustle of the earlier days of the month sensibly decreased, and the tone of the workers amongst the manfacturers give little hope for a much longer continuance of the comparative good time of the last few weeks.

W. H. BEWS.

LONDON.—The year 1884 commenced in this city with many hundreds of men out of employment and a consequent general depression of business, which, however, was thought to be only temporary, and great hopes were entertained that the year would be one of prosperity. But these anticipations were not realized, for instead of prosperity the working classes have had very little else but disaster, as the following items will show :

The North American Agricultural Implement and Manufacturing Company, which had been formed during the previous year, was intended to be a large union of the principal manufacturing firms in this city who were engaged in the agricultural implement business, and included the Globe Co. (mowers, reapers, etc.), Stevens, Turner & Burns (steam engines and separators), Plummer & Co. (waggons, etc.), and Stewart (ploughs). These firms had been employing an aggregate of 250 to 300 men, but the combination, failing to attract the additional capital that was expected to flow into it, has since led but a fitful existence, at times employing only sufficient men to keep the machinery in order, at other times putting on a few extra to give an appearance of doing something, or to fill a small order. By this policy probably 100 men have been kept in this city in expectation of work, but they have not had it above 20 to 25 weeks out of the 52.

The Steel Works, which, during 1882 and the early part of 1883, had been running very irregularly, entirely collapsed in May, thereby throwing about 100 men out of work. These men were, however, much worse off than the other unemployed ones in the city, for the company owed them about $2,400 for wages, which are not yet paid. The men were asked last week (first week of February, 1885), to accept 50 per cent. in full of their account, but this they refused.

The Ontario Car Shops shut down about the middle of December, 1882. Their hands were kept here in idleness and expectation until April 25th, when about 100 men were employed until August 1st. Then followed another shut down until September 1st, when they employed over 100 men until December 10th, when the concern was finally closed, and is now, I believe, for sale, thus having employed about 100 hands for 27 weeks during the year.

One of our shoe factories also came to grief during the year through the trouble in the Federal Bank. This threw about 100 hands out of work in July, the majority of whom are still unemployed.

The London Furniture Company, after running on short time for about three months, shut down for some weeks, after which they started up at full time, then cut wages 15 per cent., and finally went on short time again.

In September (6th) the great fire at the Grand Trunk Car Shops took place, whereby 250 men were thrown out of employment for a short time. Some returned to work again, some were transferred elsewhere, and a few were not again employed, but the fire has had a marked effect on the business of the city. In November they shut down altogether until the new year.

In the machinery trade business has been very poor, stoppage, short time and cutting of wages being the rule in every shop. E. Leonard & Sons had been perhaps the only busy shop during the year, and they cut their wages down 10 to 15 per cent. Mr. Yates has been running only fairly on the whole, and he has been shut down for several weeks, besides having cut wages to a similar extent.

The building trade, too, has been far from brisk ; even when, during the summer, their usual busy season was expected they had but little to do, and this winter they have less in hand than in any former winter for many years.

It is therefore evident that the workers of this city are not at present in very affluant circumstances, the only really busy place in the city at the present time being the soup kitchen.

Immigration has had very much to do with producing this state of affairs, employers finding that for every man wanted three or four could be got, thus enabling them to cut down wages entirely at their will. By this means less money came into the hands of the workingmen (for the poor immigrants had none), and so the small tradesmen and retailers suffered. The wholesalemen and manufacturers of course felt the effect, and here we are all down together. And here I must point out that the returns in Schedule A do not indicate this cutting down of wages, as the reductions generally took place before the last full week in April, and again after the last full week in October.

The payment of wages is very satisfactory in most shops in London, the rule being weekly or fortnightly payment in cash. One employer pays each man fortnightly about $10, letting the balance of his wages stand to his credit, but he can obtain it, or any part of it, on application. This plan, however, provides the firm with quite an amount of capital out of the wages of the men.

The relations of employers and employees, too, have been generally satisfactory, one strike only having occurred during the year, that of the printers, and the men failed to get what they asked.

JOHN R. BROWN.

OSHAWA.—A strike was in progress on the 1st November, 1883, against a reduction of 10 per cent. in wages on the part of moulders and labourers, but it was unsuccessful, the wages of the former being reduced from $2.25 to 2.00 per day, and of the latter from $1.25 to $1.12½. The furniture trade has been slack during the year, the largest factory in the town having failed in the spring of 1884. The prospects of the trade are poor indeed at the close of the year. The largest agricultural works in town having failed in October, 1884, and having only done a two-thirds business during the year, a great amount of suffering has been entailed on the employees. The malleable iron works, the tanneries, two minor agricultural works and the plough factory have run steadily during the year, with good prospects for 1885. The stove works having been burned in February, did not resume work until May. An idea may be formed of the state of the wage-workers when I say that at the time of writing (21st January, 1885), there are six of the works in town shut down, including the two large establishments above mentioned. It is scarcely necessary to add that a great amount of suffering exists amongst the wage-workers, and will continue during the winter. The carriage factories have run steadily during the year, with good prospects for the future With regard to immigrants, the Mayor of the town notifies the agents that, as there is not work enough for those who are here, it is useless to send any class of labour, there being enough paupers here already as the fruits of assisted passages to immigrants. The wages are, with two exceptions, paid weekly in money, the exceptions referred to being paid fortnightly. The relations of employers and employees are on the whole friendly, although some of the employers appear to regard labour organizations with suspicion. Some employers appear to consider the collection of statistics from the working classes as unnecessary, and to think that it is a political dodge, while a great number of the men are afraid that they will be taxed. It is to be hoped that time and the publication of the statistics will dispel their fears. I copy the report of the state of trade from the Secretary of the Knights of Labour to the Grand Secretary. "Owing to the general stagnation of trade (call it over-production, under-consumption, or what you will) partially, and partly to failure in business, the various works (tanneries and carriage works excepted) have not exceeded two-thirds time or employed two-thirds the number of hands steadily. Wages are about on a par with the majority of small manufacturing towns in Ontario, possibly in the case of the moulders a trifle higher."

JAMES R. BROWN.

ST. THOMAS.—I find the majority of mechanics idle. The agricultural shops and bronze works are (Jan. 19) shut down for an indefinite time. The railroads have discharged the greater number of their men, and building operations are entirely stopped. For this state of affairs many reasons are given, such as over-production, want of confidence in monetary circles, and immigration. Wages for the past season have been somewhat lower than in former years, from the fact that wage-earners were more plentiful, with less work to perform. As a rule they are paid promptly in cash; to railway men monthly, to others fortnightly. Mechanics denounce the present system of assisted immigration, and differ as to the efficiency of trades unions. Many claim they are beneficial, others cannot be induced to join them, but all agree that under proper management Unions are desirable. Railway men say that, without their protective associations and brotherhoods, they would be little better than slaves, while they claim that their societies afford protection to their employers by giving them more eficient and sober men, their constitutions and by-laws discountenancing strikes or other violent means of obtaining their own ends. They also complain of the contemptible manner they are followed and proscribed by their former employers when they are discharged. For instance, a locomotive engineer, discharged for running off an open switch and damaging cars only, was shut out of seven roads in Canada and the United States, where he had obtained employment, but was not permitted to go to work when his name was found out. Another, for refusing to take out a train during a strike on the road (believing it dangerous to do so), was discharged and threatened by the superintendent that he would be prevented from working on any road in America. After two years of fruitless search he was permitted to go to work on a new road in the United States when his family were destitute, his savings being spent in looking for employment. They say that, when brought before the heads of their respective departments for any grievance (fancied or real), they have no chance to defend themselves, but are punished or rewarded according to the like or dislike of the officer who is judge, jury and prosecutor. They think that all such affairs should be settled by a board of arbitrators. They respectfully ask that the Government enquire into the construction of the valve oilers now in use on the Canada Southern Railway, which recently caused the death of one of our most respected citizens. The said oilers, though dangerous and expensive, have been placed on engines formerly well equipped, against the protests of practical men, because one of the officials obtains a royalty from their manufacture. Train men on the same road protest against the system of running trains, because they are not aware of the movement of other trains. Freight brakemen want, as protection, a universal height of cars comprising the same train, hand-rails, extension running boards and less dangerous couplings.

J. Z. LONG.

TORONTO.—An impartial review of the business of the whole of the year, from November 1st, 1883, to October 31st, 1884, in so far as the city of Toronto may be considered, fairly leads to the conclusion that, notwithstanding the great accessions to its population through immigration from Europe and the annexation of suburban localities, the volume was by no means as large as that of past and more prosperous years. In most instances the cause assigned was dulness in trade and consequent stringency in money. The condition of the labour market, governed as it is by the law of supply and

demand as usually understood, evidently justified this conclusion, for the tendency of wages, without reference to any particular trade or calling, was steadily towards reduction. This reduction was greater in such trades and callings as had no organizations. As labour organizations exist in greater numbers in Toronto than in any other city in Ontario, or in the Dominion in fact, the consequence is seen in its generally higher average of wages in all callings. Notwithstanding this, the general condition of the working classes was not of a cheering condition at the opening of the winter of 1883-4 in this city. In November the employing plasterers called for a classification into two or three grades of the workers at that business, and a corresponding lowering of wages. This was promptly declined on the part of the Plasterers' Union and a "strike resulted which lasted throughout the whole winter, and it was only in the spring-days that a settlement was arrived at, but in which the Union men were not the greatest losers. As the winter set in early and the cold weather varied but little throughout the season, comparatively little building was carried on. This of course entailed enforced idleness and more or less want upon large numbers mainly dependent upon the building line for the means of subsistence. This was clearly observable in the largely increased numbers which had to be provided for throughout that winter by the many charitable and benevolent organizations of the city. Most, if not all, other trades were being carried on during the same time under reduced wages or materially shortened hours. This condition of affairs, coupled with the fact that the cost of the common necessaries of life, fuel and house-room, had not decreased in any particular, made living a heavy burthen on those who had no other capital than their labour to fall back upon for support. That the summer of 1884 had hardly recovered from the depression of the previous winter, was best evidenced by noticing that labour had made no effort to gain lost ground in the matter of wages. On the contrary, two strikes resulted from efforts at reduction. The first—or rather a series of two or three within short intervals of time—was that of the Plasterers' Labourers' Union, and which was ultimately successful on their part. The other was on the part of the Typographical Union. They, too, were successful as against the book and job offices, but were not so fortunate with the two largest morning newspapers. In this case the reduction, though nominally but 10 per cent., really amounted to 20 per cent., owing to other concessions consequent upon defeat. This strike resulted in throwing many printers upon the market for a number of months, but in time all became either absorbed in other city offices or left for other parts. In this, as in most mechanical callings, the details of wages and the averages based thereon really indicate higher than the actual facts justify, as the returns are chiefly by those most steadily employed throughout the year. As regards printers in particular, almost all the returns are by men employed by the week in book and job offices, where no reduction took place. In every calling were to be met men who declined to furnish details required by the Bureau because of being, as they asserted, ashamed to admit the smallness of the wages they were obliged to work for. Others, again, appear to be possessed of the groundless fear that their admissions as to wages earned would be, by some means, used for the purpose of assessing their incomes, which they found already but too scanty for the ordinary calls of home and family. The explanation that the collection of income tax was a matter altogether in the hands of the municipal authorities, and not controllable by the Provincial Government, did not overcome the difficulty with such people. As the advantage of the publication of labour statistics, honestly collected and correctly tabulated, becomes more apparent, no doubt the working classes as a whole will not be slow in the duty of furnishing the required details. A serious drawback to the efficient collection of such statistical information as is required in the present instance lies in the refusal of many employers of labour in factories and other places, where large numbers of men, women and children are employed, to allow collectors admission to their establishments for that purpose. Numbers, however, offered their books for the purpose of facilitating the required compilation, Such a compilation from the books of more than one establishment in Toronto would be altogether misleading, because in many of them employees not only work the regular working hours, but also take material home and, with the assistance of members of the family, work after hours and often late into the night, with the object of increasing their otherwise poor wages. The paysheet of the establishment for which such work was performed would simply indicate the amount paid the individval, without any indication of the foregoing facts. In one case the collector of statistics was denied admission to a manufactory because, as the manager asserted, the employees, being principally females, would give as their wages much less than they really earned, in expectation that the Government would do something in the direction of increasing their pay. This, of course, was not in keeping with his other assertion that all were making big wages. It is to be hoped that time, and a better appreciation of the value to the whole community of reliable statistics of this nature, will overcome most if not all the difficulties which at the present time beset their collection.

D. J. O'DONOGHUE.

PART V.

MINERALS AND MINING.

INTRODUCTORY REMARKS.

A country so rich in mineral resources as Ontario should be able to exhibit a good record of operations from year to year. But it is unfortunately the fact that, hitherto, the mining industry with us has been one of very slow development. Another fact is that, while operations have been carried on to some extent in different parts of the Province for more than half a century, the results of them have not been gathered excepting in a desultory way and at long intervals of time. Indeed the only records we have for the whole Province are those of the censuses taken by the Federal Government—for the first time in 1871, and again in 1881. But even the returns of the census are very meagre, for the only information they give relates to the quantity of raw mineral products for the year preceding the one in which the enumeration is made. There are no statistics of the number of men employed, the rate of wages paid, the value of the ore, the quantity smelted or treated at home or shipped to foreign countries, or any fact concerning the origin and progress of mining enterprise in the country. Yet there is a mass of interesting information on this subject available—scattered through reports of the Geological Survey and of the Crown Lands Department, in contemporary newspaper records, or procurable from men still living who were pioneers in the industry—and I had purposed to give in this report a succinct historical account of mining in Ontario from its earliest beginnings. But the press of other duties has interfered with this undertaking, and for the present I shall only refer to the progress of mining operations since the taking of the last census. I have the greater hesitation to deal with the history and statistics of mining as I understand that a work on the subject by Dr. Robert Bell, of the Geological Survey, is now in the press.*

CENSUS AND TRADE RETURNS.

The following table gives the quantities of raw mineral products of the Province as shown by the censuses of 1871 and 1881:

		1881	1871.
Gold	ounces	152	199
Silver	"	87,000	69,197
Copper ore	tons	170	1,934
Iron ore	"	91,887	30,726
Pyrites ore	"	1,180	500
Other ores	"	121	.....
Lump Gypsum	"	5,000	4,230
Phosphate of Lime	"	5,658	1,975
Mica	pounds	200	.....
Crude Petroleum	gallons	15,490,622	12,969,435
Salt	barrels	472,000	.....
Grained Marble	cubic feet.	5,000	8,870
Stone for Dressing	"	3,698,488	2,093,711
Roofing Slate	squares	1,536	.....

*The title of Dr. Bell's book is, "*The Mineral Resources of Canada;* an account of the Economic Geology of the Dominion, and of the progress of Mining during the last twenty years." The author's wide acquaintance with our mineral regions, and with mining men throughout the country, have given him rare advantages in the preparation of his book, and the fruit of his study and labours will no doubt be greatly prized by every one interested in the development of our mineral wealth. The collection of statistics for yearly publication was undertaken in 1870, by the Director of the Geological Survey, but the returns made by miners were so few that the work was discontinued at the end of the third year. Tables published in the

The quantities and values of the principal minerals exported, and credited to Ontario in the Trade tables, are given as follows for the four years 1881-4 :

Minerals.	1884.		1883.		1882.		1881.	
	Quan.	Val.	Quan.	Val.	Quan.	Val.	Quan.	Val.
Gypsum ..... tons..	348	642	986	1,652	465	643	1,064	1,580
Iron ..... " ..	23,432	62,004	42,745	130,257	43,005	134,573	43,872	114,037
Phosphates ..... " ..	20	160	220	2,400	2,080	28,976	2,124	25,629
Stone and Marble (unwrought) .... " ..	5,360	15,898	6,756	23,306	24,266	9,531	14,517	12,695
Salt ..... bush..	181,742	17,408	197,159	17,493	378,968	35,840	248,638	38,460

The exports of phosphates are chiefly to Great Britain, and are credited in the trade tables to the port of Montreal; the total from Ontario is about 5,000 tons yearly. The other articles as given above are sent to United States markets, and no doubt the Province is credited for its full share in the returns.

GOLD.

The chief gold fields of the Province are in the county of Hastings, and, although a number of mines have been operated during the last twenty years, there is at present only one in process of development. This is situated near the hamlet of Deloro, on the banks of the little river Moira, in what is called Canon Deloro, or the Valley of Gold. It is on the east half of lot 9, in the 8th concession of Marmora, and was discovered in 1865. The vein varies in width from four feet to twenty-five feet, and has been traced as an outcrop for a distance of eleven miles along the river. Its walls are magnesian slate, supported by granite.

The works were opened by the Gatling Company about 1870, and were continued until 1874, after which attention was given to prospecting for different ores in the locality until 1880. In that year the Canada Consolidated Company was organized by a number of Canadian and American capitalists, and the Gatling and several other mines passed by purchase into the possession of the new concern.

In August, 1883, Messrs. Rothwell and Newberry of New York, and Mr. Stephens of Detroit, formed a partnership with the object of thoroughly testing the Gatling mine, and having leased the property and the crushing and treating mills connected with it, they have been pushing operations vigorously since. Valuable machinery has been placed in the mills, and the most modern appliances are in use.

There are four shafts sunk in the working vein, two of which are connected, and levels are running towards a third. The main shaft is 175 feet deep, two others are 70 feet each, and the fourth is 50 feet. The north first gallery or level has a length of 120 feet, and the south first a length of 250 feet. Each of these is at a depth of 79 feet below the surface. The second or lower levels are at a depth of 150 feet, and extend about 100 feet each way. The richness of the ore is about the same at both levels. They are at present worked by hand drills, the miners preferring these implements, although air rock drills have been provided. Two blasts are fired daily, the first during the noon hour and the second in the evening. The men average ten feet per day of drilling for two, for which they are paid at the rate of 45 cents per foot; or say 41 cents per foot, when allowance is made for sharpening the drills.

The ore is lifted to the surface in trucks on an inclined railway—two friction drum-sticks of six feet diameter being driven by an engine of eighty horse-power—and is conveyed to the crushing mill about three hundred yards south of the mine. It is what is

Report for 1871-2 gave the results of operations in the Dominion for 1870-1-2, but they did not pretend to be complete. The Reports of the Survey since that time, however, contain a good deal of useful information on mines, minerals and the statistics of mineral production in the Dominion, and they are invaluable for reference.

known as mispickel, consisting of arsenic, sulphur and iron, and is generally very perfect and of uniform quality. Forty per cent. of the ore is pure arsenic, from ten to twenty per cent. is sulphur, and the rest is chiefly iron. There is very little free gold to be found, nearly all of it being combined with the mispickel and only separable from it by chemical treatment.

The ore is crushed with Blake crushers and Cornish rolls, screened in revolving screens, and then concentrated from 6 to 1—that is, six cars from the mine are reduced to one as concentrated. It then goes to the roasting cylinders, where the arsenic and sulphur are driven off in vapor, and the ore comes out as oxide of iron. The ore is next put into chlorinators, with bleaching powder and sulphuric acid, and one hundred and twenty gallons of water to the ton. The chlorinators are allowed to revolve for three hours, after which the charge is emptied into filter tanks and the gold solution is washed into precipitating vessels with hydrogen sulphide and becomes sulphide of gold. The precipitate is allowed to settle, and after the top solution is taken off it is collected on filters, taken to the assay office and melted into bars or bricks of pure gold. Each brick is 3½ inches long, two inches wide and three-quarters of an inch deep, and is valued at about $1,000.

The capacity of the mill is about forty tons of raw ore per day, and the lessees have been working it generally to its full limit. The crushers and screens are driven by an engine of one hundred and fifty horse-power, and the roasting cylinders and other machinery in connection with them by an engine of fifty horse-power. The cylinders are worked day and night, but in the other processes the men are employed only ten hours per day.

The average number of men at the works is about one hundred, consisting of miners, wood-choppers and common labourers. The miners, as already stated, are paid at the rate of 45 cents per foot of drilling, and earn about $2 per day. The wood-choppers are paid eighty cents per cord, and the common labourers one dollar per day.

One brick a week is the average output of the works, but account must also be taken of the arsenic, which is not unimportant as an article of commerce. At the time of my visit, in November, the quantity stored in the arsenic house was about two hundred tons. This, when re-sublimed, would give a merchantable product of one hundred and fifty tons.

The sulphur is not regarded as having any value, and it escapes through one of the tall chimneys of the works as sulphurous acid.

At Rat Portage a quartz milling Company have found rock said to yield $10 to $50 per ton. The colour of the gold is rather darker than the Californian, and it is said to be very pure.

SILVER.

It is difficult to get any exact information of the silver product of the last four years. Several mines have been worked in the Lake Superior district, but the main centre of activity is in the circle of the prospectors and promoters. A silver belt running south-west from Fort William has been developed, twenty-one locations upon it were patented during the past year, and fresh explorations are in constant progress. On twelve of the locations referred to mining has been actively prosecuted, and one shipment of ore has been made. The vein rock is chiefly white spar, loaded with sulphides, galena and native silver, and some nuggets of the latter have been obtained in clefts worn by water. The prospects of the region are so favourable that a large amount of capital has already been attracted to it.

COPPER.

Copper mining has been depressed by the failure of the Michipicoten and Mamainse lodes on Lake Superior, and still more by the unprecedentedly low price of copper—10¼

cents per pound being a late quotation. Until it falls lower and comes into competition with iron for steam and culinary utensils, or some new use for it is found in the arts, it is probable that the present depression will continue.

Indications are frequent along the line of the Canadian Pacific railway from Port Arthur to Mattawan. Near Sudbury eight claims have been entered, and assays made in Toronto and New York give 11 to 30 per cent. of copper, some silver, and in two cases gold. The ore consists of overflows of pyrites through dykes of diorite, and is both extensive and easily accessible. Exposed to air it decomposes rapidly, sulphates washing out and red oxides remaining; its treatment will consequently be simple and cheap.

No mining for commercial purposes has yet been attempted in this region, but companies are being organized and a consolidated effort is proposed. The richest mines yet found have been those furthest from the Murray mine, on the main line of the Canadian Pacific railway; and there is every probability that the mineral land extends out to Lake Huron. A geological survey from Lake Temiscamingue to Lacloche Mountains would doubtless show the real extent of the land.

IRON.

The principal iron mines of the Province, worked or developed during the past four years, are located in the townships of Bedford and Palmerston in Frontenac, of Lavant in Lanark, of Bagot in Renfrew, and of Madoc and Wollaston in Hastings.

All the mines in Frontenac, Lanark and Renfrew are on or near the line of the Kingston and Pembroke Railway; but, partly owing to the dulness of the trade and partly to other causes, they were closed for the season when I visited that part of the country in November. I was able, however, through the kindness of Mr. C. F. Gildersleeve, President of the Kingston and Pembroke railway, and of Mr. R. Macpherson, Crown Lands Agent, of Kingston, to procure statistics of the several mines; and items of general information were gathered in the various localities.

Zanesville Mine.—The first mine north of Kingston is on Thirty Island lake, in the south-west corner of Bedford. It was first opened in 1872 by the Elmira Iron Company, and during the ten years of their ownership it was known as the Glendower mine. But the operations of this Company were limited to surface mining; they never got below water level, and the total quantity of ore taken out was only 14,000 tons. In 1882 the property was purchased by the Zanesville Mining Company, of Zanesville, Ohio, and it is now known as the Zanesville mine. From the superintendent, Captain Kidd, I learned that the present proprietors commenced work in November, 1882. They have put in a double automatic compressor, capable of running fifteen drills, a boiler of one hundred horse-power, and a double hoisting engine of forty-five horse-power. A branch railway four miles in length was finished in May of last year, connecting the mine with the main line of the Kingston and Pembroke road, and the arrangements for working the mine and handling the ore are very satisfactory. Two shafts have been sunk, the deeper one being 180 feet, out of which were taken 1,400 tons in 1883 and 7,000 tons in 1884. On the 18th of August, last year, a flow of water was struck which the pumping capacity of the engine was not able to overcome, and the works were closed for the season. It was the intention of the Company to put in a large pump and to resume operations this spring with a double force of men, working night and day. They employed 22 men last year, working in the day time only, and the average rate of wages for common labourers was $1.12 per day. The ore of the mine is entirely free from titanium, and is adapted for making No. 1 Bessemer steel.

Robertsville Mine.—This mine is situated in the south-east corner of the township of Palmerston, two miles south of the Mississippi river and one mile from the Kingston and Pembroke railway, with which it is connected by a branch line. It has been worked by the Roberts Iron Company, the stock of which is owned in Rochester and other parts of the State of New York. The machinery consists of an air compressor, eight drills, a double hoist, a steam boiler of fifty horse-power, and other plant. From 1880 to the

close of 1883 the quantity of ore shipped from this mine was 28,900 tons, but it was idle the whole of last year. I understand that the manager of the Company was employed in opening up another mine in the County of Renfrew, near the Ottawa River.

Boyd Caldwell Mine.—The Boyd Caldwell mine is at Wilbur station, in the south-western part of the township of Lavant, close to the Kingston and Pembroke road, and a siding is laid from the track to the mouth of the shaft. The machinery consists of a twenty horse-power boiler, a steam hoist and other plant. The shaft has been sunk about 75 feet, and 6,000 tons of ore have been taken out, but the mine had been closed for some time previous to my visit. It is owned by Mr. Boyd Caldwell, of Lanark.

Wilbur Mine.—This one is near the Boyd Caldwell mine, and is owned by the Wilbur Iron Mining and Manufacturing Company, the stock of which is controlled at Bethlehem, Pennsylvania. Its machinery consists of an air compressor for driving six drills, a double hoist, a fifty horse-power boiler and other plant. The quantity of ore shipped from it in 1882 was 8,000 tons; in 1883, 17,000 tons; and in 1884, 9,200 tons. The hamlet of Wilbur has a population of about 250 souls, nearly all of whom are miners.

W. C. Caldwell Mine.—This mine is owned by W. C. Caldwell, M.P.P., of Lanark, and others. It is situated about a quarter of a mile from Flower station, on the Kingston and Pembroke road, in the northern part of the township of Lavant. The machinery consists of a twenty-five horse-power boiler, a steam hoist, etc. A shaft has been sunk to a depth of 75 feet, and about 2,000 tons of ore have been taken out. The needle indications are that this and the Raddenhurst mine, immediately to the north of it, are parts of the same deposit, and that it is one of great extent.

Raddenhurst Mine.—This is the property of parties in the town of Perth. One shaft has been sunk to a depth of 80 feet, and other excavations have been made. It is provided with two steam boilers of ten horse-power each, a steam hoist and other plant.

Calabogie Mine.—The Calabogie mine is in the township of Bagot, two miles east of Calabogie lake and on the south side of Madawaska river. It is owned by the Calabogie Mining Company, the stock of which is held in the town of Perth and in the United States. Three or four openings have been made, the first of which is close to the Kingston and Pembroke railway, and 1,300 tons of ore were shipped in 1883 and 1884.

The following table gives analyses of ores of the Zanesville, Wilbur and Calabogie mines:

Constituents.	I.	II.	III.	IV.
Metallic Iron	63.80	62.32	58.49	61.627
Silica	8.30	10.67	9.15	.....
Lime	0.09	0.64	3.32	.....
Magnesia	.....	.....	5.66	.....
Alumina	.....	.....	.28	.....
Manganese	0.47	0.51	1.79	0.389
Sulphur	0.12	0.39	.12	0.077
Phoshoric Acid	.....	.....	0.71	.....
Phosphorus in Phosphoric Acid	.....	.....	0.31	0.018

I. and II. are from shafts 1 and 3 in the Zanesville mine and III. from the Wilbur mine, the analysis for each having been made by E. M. Reed, of Zanesville, Ohio. IV. is from the Calabogie mine, analyzed by C. F. Chandler, Ph. D.

Wallbridge Mine.—This is a mine of red hematite iron, and is situated on lot 12 in the 5th concession of Madoc, county of Hastings. It was first opened many years ago by Mr. D. L. Cumming, the original owner of the land, who sent a sample lot of eight tons to Three Rivers, to be smelted there. But earnest operations were not commenced until 1879. In September of that year it was leased by Mr. Coe, of Madoc village, for a period of fifteen years, on a royalty of fifty cents per ton. He took out and shipped 15,000 tons the first year, after which he disposed of his interest to the Bethlehem Iron Company, of Pennsylvania. This Company worked the mine for three years, taking out about 50,000 tons, and Mr. Coe again acquired possession. It was supposed at the time

that the deposit was almost wholly exhausted, but 6,000 tons have been extracted since July, 1883, and there are no signs of the bottom being reached. During the past season 20 to 24 men were employed, who put up 100 to 150 tons per day, and, at the date of my visit 12 men were at work getting out ore for this year's market. The iron is of fine quality, but at the smelting works hematite and magnetic ores are generally mixed, the former being found to act on the latter as a flux and so dispenses with the use of limestone. The Belleville and North Hastings railway runs up to this mine, and hopes are entertained of its extension further north.

Seymour Mine.—This is a mine of magnetic ore on lot 11, south of the Wallbridge mine. It was worked during 1878, 1879, 1880 and part of 1881, but was abandoned towards the close of the last year, it having got into a fault at a depth of 110 feet. This mine was operated under the directions of Mr. C. J. Pusey, who represented a number of New York capitalists.

Brook Mine.—The Brook mine was near the village of Bannockburn, in Madoc. It proved to be only a small pocket, and was cleaned up in one season.

Orton and Baker Mines.—These are in the township of Tudor, and work upon them has scarcely begun yet. Cross trenches have been cut, and the Orton has been pierced with a diamond drill at a depth of 200 feet. It is about 1,200 feet long, and 20 to 80 feet wide—the width increasing with the depth. Near the surface the ore is mixed with titanium, but lower down the proportion of this undesirable metal is found to decrease. The Baker mine is 15 to 35 feet wide and half a mile long. Like the Orton, it is a rich magnetic ore, but its value is impaired by the presence of sulphur.

Coe Hill Mine.—The Coe Hill Mine is on lots 15 and 16 in the 8th concession of Wollaston, in Hastings. The vein was discovered by Mr. Coe nine years ago, and the property was purchased by him from the Batchelor brothers, who were the original settlers upon the lots. At that time there was no railway nearer than forty miles, and nothing was done to develop the mine until three years ago, when arrangements were made for the early construction of the Ontario Central Railway. This road is an extension of the Prince Edward Railway, and runs from Weller's Bay northward into the county of Hastings. The track was laid last June to the Coe Hill mine, a length of 78 miles from the Bay, and it is proposed to extend it farther north and to build branch lines to serve the whole district. In 1881 the first opening was made in the mine; in the following year the property was put into the hands of a joint stock company, and up to the end of last year about 60,000 tons of ore was taken out and one-half of it shipped to Cleveland. The mine forms a high ridge about 1,500 feet long, and the vein is 20 to 60 feet wide, covered in places with one or two feet of earth, and in others cropping out at the surface. The foot wall is greenstone with portions of granite, while the hanging wall is chiefly granite and quartzite of lime. It has been crossed in one place with a diamond drill at a depth of 280 feet, and at two others at a depth of 300 feet, and the quality of the ore is found to be uniformly good throughout. There is scarcely a trace of titanium, phosphorus, or other injurious substance, and it is considered to be a first-class Bessemer ore yielding about 66 per cent. of pure metallic iron. Three shafts have been sunk in the mine, and the total length of the openings is about 1000 feet. No. 1 shaft is 123 feet deep, with one drift or tunnel of 75 feet. The ore has been removed to a width of 29 feet, without touching either the foot or the hanging wall, and I was told by the captain of the works that, of the total quantity extracted up to the beginning of November, there was less than one load of rock. No. 2 shaft is 400 feet north-west of No. 1, and has been sunk to a depth of 115 feet. No. 3 is 300 feet west from No. 2, and is 112 feet deep. Each of these has three distinct openings, connected by drifts to winzes east and west of the main shaft.* The ore is lifted to the surface by means of hoisting drums driven by an engine of 275 horse-power, and the plant throughout is of the best labour-saving pattern. At the time I visited the mine 115 men were employed by the Company, of whom 40 were miners and the rest carpenters and labourers. The miners were chiefly Cornish men, and were working by night and day shifts, taking out 100 tons of ore daily.

* A drift or level is the working part of the mine, and opens into the vein at right angles to the shaft. A winze is a small shaft on either side of the main one, connecting two levels for the purpose of ventilation.

Heretofore they have been employed most of the time on "dead" work—sinking shafts and winzes, driving levels, etc.—but the mine is now in a position to take out 500 tons per day. The wages paid to miners average about $1.35 per day, and to choppers and labourers about $1 per day. Cottages have been built for men with families, and a large boarding house gives accommodation to the rest of the employees.

Arthur Mine.—The Arthur mine is in the township of Chandos, seven miles south-west from the Coe Hill mine, and was discovered in September, 1883. It is about 1,000 feet long and 20 to 70 feet wide. Three diamond drill holes have been made at depths of 180, 260 and 280 feet, and the quality of the ore improves with the depth. It is a magnetic ore of superior quality, but not more than 1,200 tons of it has been mined. The property is owned by the same Company that owns the Coe Hill mine.

Eight or ten other mines have been discovered in this district, and although they are not yet beyond the prospecting stage it is believed that the deposits are of great extent and the ore of superior quality. It is probable that no attempt will be made to work them until the iron trade revives, and branch lines of the Ontario Central Railway are constructed to provide shipping facilities.

Toronto Iron Co's Mines.—The Toronto Iron Company was organized in 1881, having been promoted by Charles J. Pusey, of New York, the representative of a number of New York capitalists. Mr. Pusey began operations in 1879 at Irondale, in the Snowdon district, five miles from Victoria Railway. He opened a mine of magnetic iron in 1880, and one of hematite iron in the following year. A trial lot of 1,000 tons of the magnetic ore was shipped to Johnstown, Pa., in 1881, which was found to be free from phosphorus and to yield about 60 per cent. of iron. The opening of the mine is 70 feet deep, 30 wide and 80 long, but the metes and bounds of the vein have not been ascertained. Nothing further was done with this mine for lack of working capital, but Mr. Pusey is hopeful of renewing operations this spring and ultimately of being able to construct a railway from Irondale, in Snowdon, to Bancroft, in Dungannon, through the heart of a region rich in hematite and magnetic ores. Pine Lake mine in the township of Glamorgan, is 1,800 feet long and an average of 125 feet wide; and there are, besides, one mine 1,500 feet by 40, a second, 1,400 feet by 40, and a third, 1,300 feet by 25, all of which are of magnetic iron. The National mine is a mountain of hematite ore 1,200 feet long by 400 feet wide. All these are awaiting the construction of a railway for development.

BUILDING STONE.

A quarry of freestone has recently been opened in the township of North Elmsley, in Lanark, that possesses excellent qualities as a building stone. It is easily worked, hardens soon after exposure, and when submitted to the severest test it does not chip. In sections it is stained with manganese, and the contrast of lines of purple on a ground of grey is very pleasing to the eye. A church built of this stone in Perth is one of the most attractive architectural features of that neat town. It is what is known as Potsdam sandstone, and I was informed by Mr. W. J. Morris that the belt starts from Bathurst, extends over North Elmsley, touches South Elmsley and Bastard, and crosses the Rideau Canal at Portland, the total length as far as traced being about ten miles. The width varies from one thousand to two thousand feet, and there are two layers of an average thickness of 15 to 18 inches, but in some places a layer attains the thickness of five feet.

LITHOGRAPHIC STONE.

This stone is found in the vicinity of Marmora village, in the county of Hastings, but there is a difference of opinion among engravers as to its qualities. Possibly it has not yet received a fair test, and it may be that the quality will be found to improve as the quarries are developed. About four tons of the stone was shipped by Mr. William

Kelly to Montreal last year, over the line of the Canadian Pacific Railway. It was taken out of a quarry on the west side of the village. Sir William Logan found a bed of two feet in thickness in this band to be extremely fine in its grain, and to yield a lithographic stone of excellent quality. In the Geology of Canada (1863), he says: "It has been repeatedly tried by lithographers, both in Canada and England, with most satisfactory results, but owing to the remoteness of the locality no attempt has hitherto been made to work the stone." The band may be traced for about a hundred miles, from Hungerford, in Hastings, to Rama, on Lake Couchiching, and at several points it is now crossed by railways.

LEAD.

Only one lead mine is worked in the Province at present. It is the property of Pellew & Co., of Montreal, and is situated on lots 23 and 24, range 6, township of Fitzroy, in the County of Carleton. The direction of the lode is south-east by north-west, and its width varies from three to eight feet. Two shafts have been sunk, one of which is 30 feet deep and the other 70 feet, and both are thoroughly timbered. Mining operations were commenced last year on the 1st of May, and during that month about 15 men were employed; but from the 1st of June to the end of October the average force of miners and labourers was 30 men. The quantity of dressed ore sent to the smelting works at Kingston during the season was 275 tons of 2,000 lbs. each, and the yield of lead therefrom averaged 51.09 per cent., or 281,000 lbs. The quantity of undressed ore remaining to be treated at the mines on the 1st of November was estimated to yield 300 to 400 tons of clear ore. Hoisting has hitherto been done by horse-power, but steam-power is being introduced.

At the smelting works of the Frontenac Lead Mining and Smelting Company, at Kingston, 486,522 lbs. of galena were smelted during the months of June, July, August, September and October, the yield of which was 254,376 lbs., or an average of 52.28 per cent. Eight men were employed at these works during the season—one foreman at $3 per day, five labourers at $1.50 each, and two blacksmiths at $1.60 each. The wages of exmployees at the mine ranged from $1 to $1.50 per day.

APATITE.

Rich deposits of apatite, or mineral phosphate of lime, are found in the townships of Burgess and Elmsley, in the county of Lanark, where mines have been worked by capitalists and farmers on a considerable scale during the past twenty years. Captain Robert C. Adams, of Montreal, is the owner of 1,800 acres of phosphate mining lands on the north shore of Lake Otty, where the ore is found chiefly in the mass and not in crystals as in various other localities. The average yield of phosphate from his mines is 77 per cent., but it runs up as high as 90. Mining operations here are carried on in part by men engaged as day labourers, but chiefly under the contract system. The cost of mining by contract is about $7 per ton; and while the system has the merit of inducing miners to prospect for rich deposits, it has the demerit of causing them to abandon mines that pay to be thoroughly worked. For this reason it is probable that in the future operations will be carried on more and more by day labourers, and that each deposit will be cleared out before the workmen proceed to a new one. So many good mines have been already opened that this plan may now be adopted by proprietors with perfect safety, and with wages at $1.25 per day the cost per ton will be very little more than under the contract system. Farmers who have deposits on their property work them during the fall and winter months, and in this way they are enabled to make a very substantial addition to the farm income proper.

The principal dealers in phosphates are Mr. Davies, of Perth, and Richardson & Sons, of Kingston. I have obtained from Mr. Davies the following statement of his shipments and the average price per ton delivered on the Rideau Canal for the past four years :

	Tons.		Per ton.
1881	1,945	.....	$15 00
1882	1,579	.....	14 50
1883	1,680	.....	15 00
1884	1,147	.....	11 00

Of the above, 4,500 tons came from the mines of Captain Adams and the balance from other mines. About 700 tons of phosphate rock, taken out last year, were in the hands of miners on the 1st of November.

Messrs. Richardson have handled during the last eight years an average of 2,500 tons yearly, but last year their shipments fell off to 635 tons. During that period prices ranged from $7.50 to $18, but the average price was about $14.50 per ton. The low price obtained last year was due to the slackened demand in England, where the bulk of Canadian phosphates have heretofore found a market, and, owing to the agricultural depression in that country and on the European continent, the present prospect of a rise in price seems to depend on the opening up of new markets elsewhere.

A sample lot was shipped by Messrs. Richardson last year to Philadelphia, and its product is reported to have given good satisfaction to the manufacturers. The average yield is not less than 75 per cent. of phosphate of lime, while the best average of South Carolina phosphate (the chief source of mineral phosphates in the United States) ranges between 55 and 61 per cent., and much of it is under 50 per cent. The mining of South Carolina rock was begun in 1868, and the United States census shows that the domestic consumption increased from 52,244 tons in 1875 to 195,966 tons in 1881. It is therefore not improbable that the coming market for Ontario phosphates may be found in the United States.

A mill for the manufacture of superphosphates was in operation for some time in the town of Brockville, but it is now idle. The cost of sulphuric acid is the chief item of expense connected with the process, and for this reason the manufacture is generally confined to districts where sulphuric acid is prepared.

MICA.

Numerous veins of mica have been discovered in the eastern portion of the Province, but few of them have been found to yield the mica of commerce. A very good sample of silvery mica has been found in the township of Burgess, and specimen crystals of large size and good quality have been secured by prospectors. A mine has been worked in Loughborough, but the crystals are very dark in color and hardly suitable for any of the common uses of mica in the arts. Richardson & Sons, of Kingston, have been developing a mine on the farm of Mr. Bruno Turcotte, lot 24 in the 2nd range of Palmerston, in Frontenac. The vein is from two to three feet in width, and it has been traced as an outcrop in granite for five or six miles across the country. When I visited this mine in November I found that a shaft had been sunk to a depth of twenty-five feet, work having been in progress for two months. The mica was of the silver variety ; but, as frequently happens where the vein is found in granite, it was more or less distorted, and it was almost impossible to obtain a larger size than five by seven inches of clear leaf. Books were found to vary in thickness from three to ten inches, and the largest size of leaf taken out was nine inches by sixteen. Landry's mine, four miles west of Richardson's, yields mica of the same quality, and some books have been taken out two feet square. Mr. Dwyer, of Ottawa, is organizing a company to operate it.

SALT.

The exact area of the salt region of Ontario has not yet been determined, but it is known to embrace nearly the whole of the counties of Huron and Lambton, and portions of Bruce, Middlesex and Kent. Numerous borings have been made in these and adjoining counties, and while in some directions the limits are well defined, they are in others the subject of doubt and speculation. Test wells sunk at St. Marys and Tilsonburg twenty years ago showed that rocks of the salt-bearing series extended eastward as far as these towns, but the brine was not found of sufficient strength to pay for working. During the present year a first-class well has been sunk in the town of Bothwell, and a line drawn thence to Courtright on the St. Clair river may be said to form the present limit of this region towards the south. A line from Bothwell northeasterly through Parkhill to Brussels, and thence northwesterly to Kincardine, forms the known bounds of the field towards the east and north; while on the west the wells at Kincardine, Goderich, Port Franks and Courtright indicate that it extends to Lake Huron and River St. Clair. Borings made at Southampton and Port Elgin, north of Kincardine, showed that the underlying rocks were of the Guelph, Niagara and Medina formations, and consequently below the Onondaga and Salina, in which the salt rock occurs. A well bored by Mr. McEwen, on the north side of Brussels, to the depth of 1,248 feet, yielded a very weak brine; whereas one on the south side, half a mile distant, yielded brine of paying strength at a depth of 1,000 feet. It was found, however, that the salt strata here were much thinner than at points farther south. Mr. McEwen, also made borings of 1,200 feet at Listowel, of 1,800 feet at Waterloo, of 2,000 feet at Mitchell, and of 1,400 feet at Dublin, without finding any salt at either place; but Messrs. Kidd's well, five miles west of Dublin, gave brine at a depth of 1,050 feet, and the three beds were penetrated within a depth of 1,150 feet. From this point north-westward to Kincardine the limit of the salt area is apparently well defined, but to the south-eastward and southward it is not unlikely that good wells may yet be sunk outside the lines laid down from present knowledge. In Goderich and its suburbs thirteen wells have been put down since the first discovery of salt there in 1866, but during the past year only six of these were in operation. The total number of wells worked was twenty, but two others were opened—one of them at Kincardine, and the other at Parkhill. The following list gives the number of wells concerning which information has been obtained, the location of each, and the name of the owner or lessee.

No.	Location of Well.	Owner or Lessee.
1	Maitlandville	Peter McEwen.
2	Goderich	Peter McEwen.
3	Goderich	Samuel Platt.
4	Goderich	Joseph Kidd.
5	Goderich	North American Chemical Co.
6	Goderich	Ogilvie & Hutchinson.
7	Stapleton	R. Ransford.
8	Seaforth	Gray, Young & Sparling.
9	Blyth	Gray, Young & Sparling.
10	Dublin	J. & J. Kidd.
11	Hensall	Hensall Salt Co.
12	Kincardine	People's Co-operative Co.
13	Port Franks	Williams & Murray.
14	Warwick West	Charles J. Kingstone (Executor).
15	Goderich	John Scobie.
16	Clinton	John McGarva.
17	Seaforth	S. S. Coleman.
18	Seaforth	T. Kidd.
19	Kincardine	L. Rightmeyer.
20	Brussels	F. C. Rogers.
21	Exeter	Exeter Salt Co.
22	Parkhill	Robert Phipper.
23	Courtright	Courtright Salt Co.

The records of fourteen of those wells have been given me by the proprietors or managers, and following the numbers in the preceding list these are the particulars :

No. 1 is the pioneer well of the Huron salt district, having been opened in 1866. It is situated at the end of the Maitland bridge, just across the river from the town of Goderich, in the little village of Maitlandville. Mr. McEwen has held the property under lease for several years, but the well has not been worked since 1881, and the lease expired in January of this year. It has been operated altogether about fourteen years, and has been idle five years. Salt was found at a depth of 965 feet, but the first bed only was tapped (its thickness being sixteen feet), and the total depth of the boring is 1,000 feet.

No. 2 is at Goderich harbour. It was opened in 1870, and has been worked eleven years out of fourteen. The total depth is 1,100 feet, and the boring penetrates the three beds of salt rock. The first bed, reached at 970 feet, is 16 feet, the second is 21 feet, and the third is 30 feet.

No. 3 is on the south side of the Maitland river, in the town of Goderich. It was sunk in 1870, and the works have been carried on continuously since. This well is remarkable for the great depth of the first and third beds of salt—the first, which was reached at 900 feet from the surface, being 109 feet, the second 5 feet, and the third 100 feet. The total depth of the well is 1,114 feet.

No. 4 was opened in 1874, and has been worked eleven years. The salt rock was found at 1,000 feet, and the boring was only carried through the first bed, which has a thickness of 20 feet.

No. 5 is an old well, and has been worked by its present owners since 1879. It has a depth of 1,137 feet, of which 30 feet is through the first bed of salt. The brine at this well is treated by a chemical process, and a large proportion of the product is graded as dairy and table salts.

No. 6 adjoins the flouring mills of Messrs. Ogilvie & Hutchinson. The boring was begun last year, and was carried to a depth of 1,100 feet. The brine is evaporated by heat of the exhaust steam of the engine, and the pan has a capacity of ten tons per day.

No. 7 is at the village of Stapleton, one and a quarter miles east of Clinton. It was opened in 1867, and has been worked by the owner ever since. The salt rock was found at a depth of 1,151 feet, but the boring was only carried through the first bed, which has here a thickness of 15 feet. The total depth of the well is 1,180 feet.

No. 8, at Seaforth, was opened in 1871, and has been operated thirteen years. The first salt bed was tapped at 1,040 feet, and it was found to have the extraordinary thickness of 118 feet. The total depth of the well is 1,158 feet.

No. 9 is at the village of Blyth, and has been worked since its opening in 1878. Salt was reached at 1,110 feet, and the first bed was penetrated 90 feet. The total depth is 1,200 feet.

No 10, five miles west of Dublin, was sunk in 1873, and has been worked eleven years. The first bed was reached at 1,050 feet, the second at 1,080, and the third at 1,110. The total depth of the boring is 1,150 feet. The brine is conveyed by a pipe line to the evaporator at Dublin.

No. 11, located at the village of Hensall, was opened in 1883, and has been worked two years. Two beds of salt have been penetrated, the first at 1,100 feet from the surface, and the total depth is 1,200 feet.

No. 12 is an old well in the town of Kincardine, in Bruce county. It had been lying idle for about ten years, but in May of last year it was purchased by the People's Co-Operative Company, and several months were occupied in renovating the works. At the beginning of the present year the daily output was 350 barrels, and twenty-five men

were given employment. The salt rock was reached here at 810 feet, and the boring was carried through two strata—the first having a thickness of twenty five feet, and the second of twenty-four. The total depth is 981 feet.

No. 13 is at Port Franks, in the County of Lambton. It was opened in October, 1883, and has been operated a little over one year. Salt was reached at 1,245 feet, but the depth of the bed was found to be only ten feet. The second bed is eighty-five feet, and the total depth is 1,355 feet. The record of the boring is as follows: Sand, clay and gravel, 260 feet; limestone, 940 feet; shale 45 feet; salt and shale, 110 feet. Boring was stopped in the second bed of salt.

No. 14 is located on the east half of lot 6 in the 3rd concession of Warwick, in Lambton, known as the Elarton Salt Works. It was opened in July, 1870, and has been operated about fourteen years. The first salt stratum was struck at 1,200 feet and the boring was continued into hard limestone 67 feet below the third. Following is the record: Boring to salt rock, 1,200 feet; first bed of salt, 24 feet; very hard limestone, 15 feet; second bed of salt, 30 feet; alternate beds of salt and shale, 61 feet; hard limestone, 67 feet. Total depth of boring, 1,397 feet.

The first salt-bed is usually found to be interleaved with shale, about half and half of its entire thickness. The second is of similar character, but with a diminishing quantity of shale, the proportion being about two to one. The third is often found to be pure rock salt, of varying thickness, and in appearance like clear, transparent ice.

Pipes of three inches diameter are usually sunk in the wells to a depth of 600 feet, and when fresh water is pumped out the brine from the mine is forced up to fill the vacuum. In nearly all the wells the brine is of the strength of 100 degrees, or the highest point of saturation as gauged by the salometer. It is pumped into large tanks, and thence conducted to the evaporating pans as it may be required.

The pan of average size is about 110 feet long, 25 feet wide, six or eight inches deep, and is usually divided by a partition 60 feet from the front. Heat is generally supplied by furnaces of wood fuel, but in one or two instances by exhaust steam. One cord of the best body wood produces about twelve barrels of salt from brine of 100°, and at Goderich the average price of wood delivered at the wells is about $3.50 per cord; in the rural districts it is somewhat less. The lifetime of a pan varies according to the heat applied to it, but the front half generally requires renewal every two years.

The grain of salt depends on the temperature at which it is produced. Common coarse salt is drawn from the rear of the pan, where the temperature of the brine is kept at 140° to 150°. Its grain is about the size of a kernel of wheat, and is used for curing meats and fish. Common fine, which in England is called "boiled" salt, is drawn from the front of the pan, where it is produced at a temperature of 212°, or at the boiling point of water. It is the grade in common use for farm purposes. No other treatment is given these grades than to let them stand for drainage ten days or two weeks in bins, the bottoms of which have been tapped with auger holes; the salt is then ready to be put up in barrels and sent to market. The dairy and table grades are kiln-dried, ground and sifted, and are usually put up in cotton bags of 3 lbs., 5 lbs. and 10 lbs. each. What is known as land or refuse salt is any salt that is off color, as when the pans are rusted, either when newly put in or after they have been cleaned. It is used almost exclusively as a fertilizer, and at a moderate price it is in good request.

An effort was made to collect statistics of the various wells in operation for the past four years, or since the taking of the last Government census; but of the twenty-one wells in operation during that period returns of any kind were received from only four-

teen, and complete returns of product, value and wages from only eight. The latter are presented by total quantities and averages in the following table :

——	1884.	1883.	1882.	1881.
No. of Wells	8	8	7	7
Barrels of—				
Common Coarse Salt	15,826	19,313	15,033	35,850
Common Fine Salt	99,361	82,390	105,814	141,172
Dairy and Table Salt	15,271	15,897	21,737	19,470
Land Salt	14,627	14,182	23,606	27,233
Totals	145,085	131,782	166,190	223,725
Value of Salt $	114,007	121,580	128,237	127,790
Average value per bbl $	0.78½	0.92¼	0.77	0.57
No. of workmen (exclusive of coopers and choppers)	78	85	81	91
Total wages paid workmen $	22,224	23,353	22,751	27,304
Average wages $	285	275	281	300

The only other statistics obtained of this industry are those of the Salt Association, which was organized in Goderich on the 28th of March, 1882, and began business on the 1st of April. I am indebted to the secretary of the Association, Mr. John Ransford, for the following figures of output and valuation :

——	1884.	1883.	1882.
Number of Wells in Association	16	15	12
Barrels of output	189,338	252,000	275,000
Total value $	143,536	214,315	209,000
Average value per barrel $	0.76	0.85	0.76

These returns are exclusive of local sales and sales of dairy salt, which, by the terms of the combination, each owner or manager of a well is allowed to effect for himself. The statistics for 1884 are for the first eight months of the year only.

PETROLEUM.

The petroleum industry is now almost wholly possessed by the town of Petrolia and the oil producing district of which it is the centre. London was at one time the chief seat of refining operations in the Province, but by degrees this business has gone to Petrolia, and at the opening of the present year two refineries were all that remained of an industry which had built up a thriving town on the outskirts of the city, which had given employment to hundreds of skilled and unskilled labourers, and in which large fortunes had been made and lost.

Since the repeal of the inland revenue duty on petroleum in 1877 there are no records of the quantity produced in any year, saving the returns of the census. According to this authority the product of crude in 1880 was 15,447,422 gallons in Lambton, and 43,200 gallons in Kent, being a total of 15,490,622 gallons, or say 370,000 barrels of 42

gallons each. In Lambton during the same year eight refineries were in operation, employing 100 hands, paying $49,200 in wages, and converting raw material valued at $806,000 into manufactured product valued at $1,405,800.

Detailed statistics of the industry have been greatly desired by oilmen, but no organized attempt to collect them was made at Petrolia until last year, when an Oil Exchange was formed and a plan was devised for obtaining trustworthy returns of the industry. I have been favoured by Mr. James Kerr, the secretary of the Exchange, with the following statement:

Population engaged in the oil business, directly and indirectly	6,000
Number of wells in the district	2,300
Number operated in 1884	2,200
Barrels of petroleum produced	550,000
Number of refineries in the district	10
Number operated in 1884	9
Barrels of refined oil made	182,685
Value of raw product	$467,500
Value of manufactured product	$1,210,000
Number of skilled hands employed	400
Number of unskilled hands	500
Wages paid to skilled hands per day	$2.00 to $4.00
Wages paid to unskilled hands per day	$1.25 to $1.50
Barrels crude oil in storage tanks, December 1, 1884	373,000
Barrels crude oil in tanks at wells and refineries	51,000

These figures are based on actual count, with the exception of the number of men employed and the rate of wages paid, which are given as the result of careful enquiry and estimate. Mr. Kerr states that in the strict sense there are very few unskilled labourers employed in connection with this industry, as they are of little use. In almost every branch of it men are required who possess skill and experience to rank them above the common labourer.

PART VI.

THE CLIMATE OF ONTARIO.

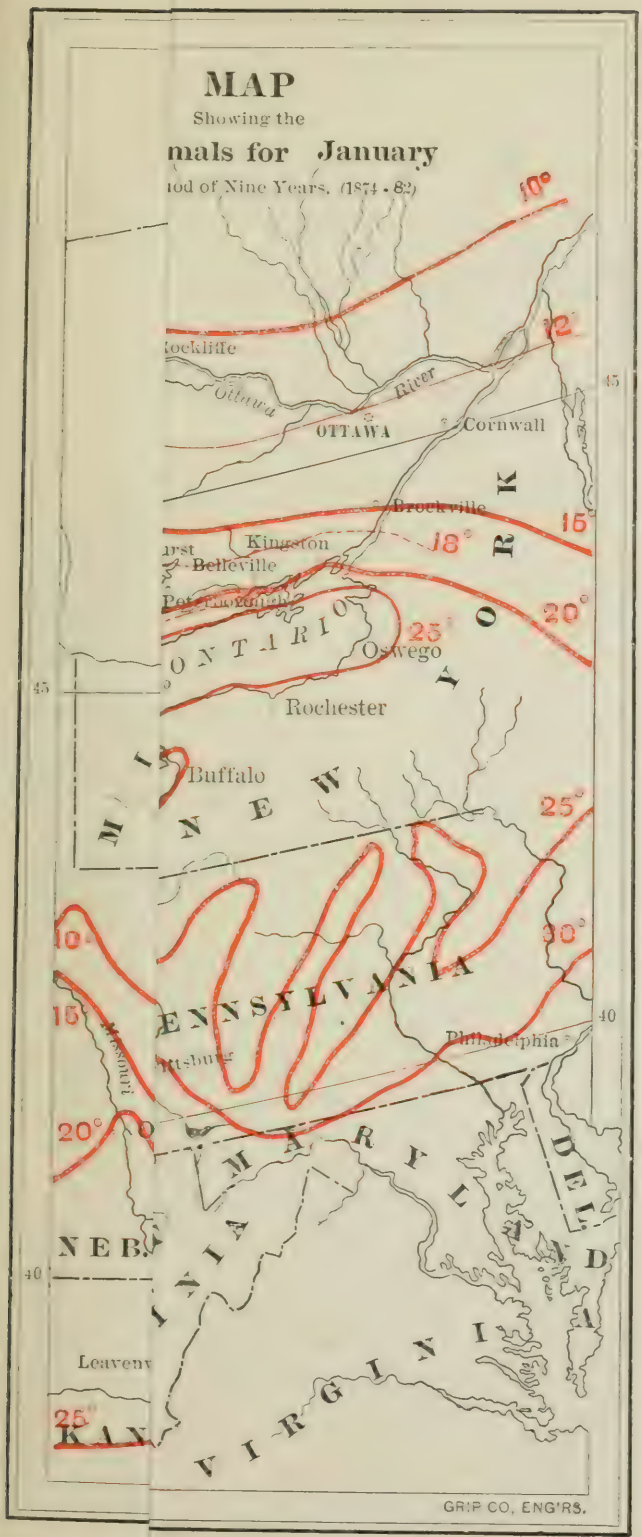
A COMPARISON WITH NEIGHBOURING STATES.

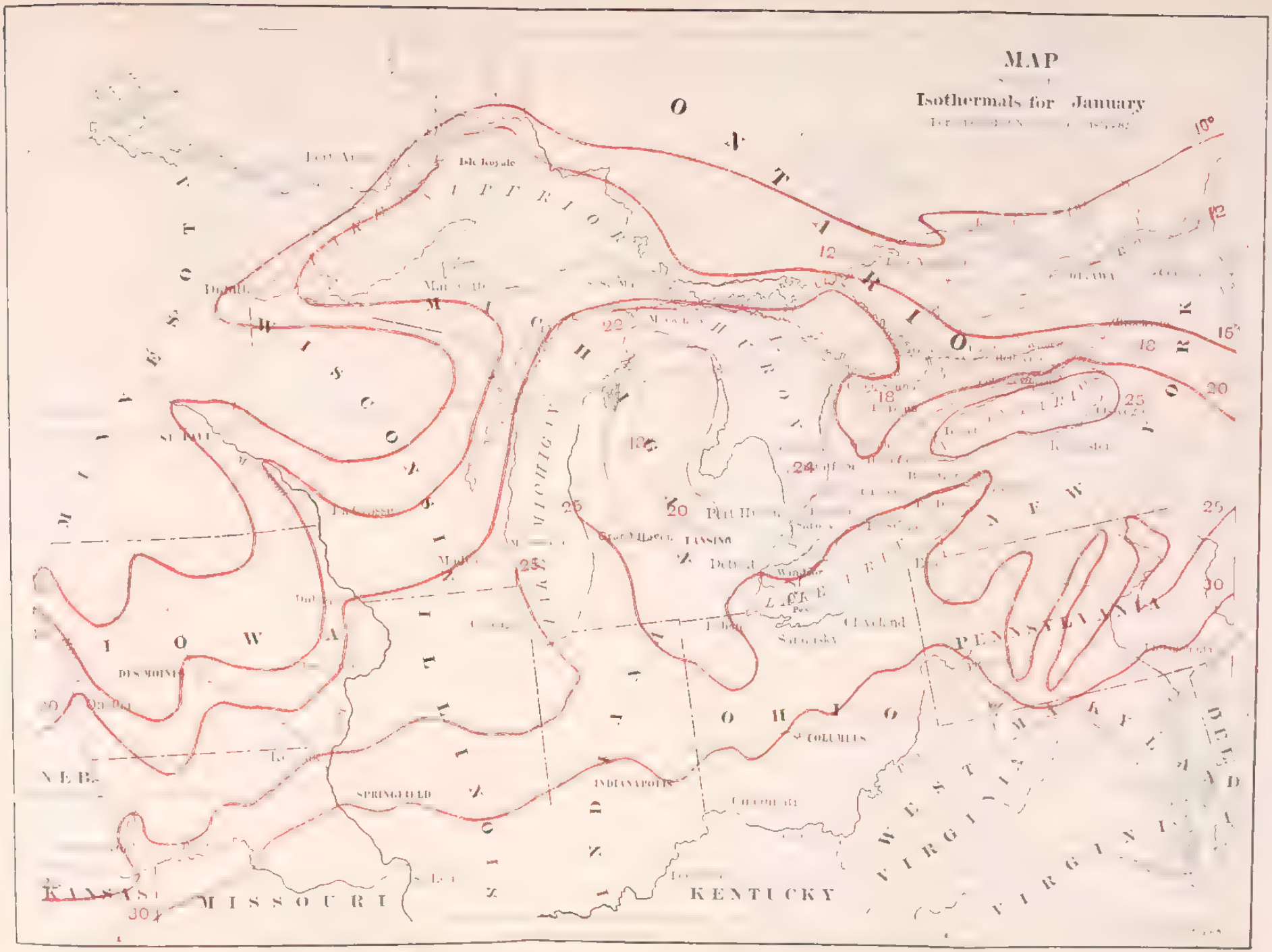
BY J. GORDON MOWAT.

While of late years the merits of the climate of Ontario have become better known than formerly both in Europe and Canada, there yet remain many erroneous impressions, especially in regard to the severity of the winter season, which are detrimental to the interests of the Province, inasmuch as they tend to divert agricultural settlement to other less favoured portions of this continent, and to make Ontario farmers neglect to improve the opportunities in fruit-growing and other branches of farming which the almost unrivalled capacities of the climate of this Province afford. It is with the view of correcting some of the misconceptions which prevail that this paper, with its accompanying map, is presented.

The map shows the trend of the isotherms, or lines of average heat, for the month of January across that portion of this continent lying between the meridian of the eastern extremity of Ontario and the meridian of eastern Nebraska, and north and south between the north shore of Lake Superior and the valley of the Ohio. The isotherms are based on observations extending over a period generally of nine years, 1874 to 1882, published in the reports of the Canadian Meteorological Service, the American Signal Service, various State Bureaus of Weather, and the Michigan Board of Health. Where paucity of observations has precluded the use of actual records of temperature, advantage has been taken in drawing the isothermal lines of well known laws respecting differences of temperature due to differences of elevation above sea level. Recourse, however, has seldom been made to this method of filling up gaps in the line, inasmuch as the records, especially for Ontario, Ohio, Michigan, Indiana, Illinois, Missouri and Iowa, are sufficiently full. In the cases of stations where the record of observations extends over a shorter period than the nine years under consideration, the deviation above or below the normal for each such shorter period at neighbouring stations with complete records has been used almost invariably as a correction by which to obtain the true normal. In all, the records of about fifty meteorological stations in Ontario and nearly one hundred and fifty in the United States have been utilized in the preparation of the map.

At the leading signal service stations in the United States, and at a few in Ontario, the mean temperature is taken from tri-daily observations at equal intervals. The Toronto and Woodstock averages are derived from the mean of eight observations a day; those of ten other Ontario stations from readings at 7 a.m., 1 p.m. and 9 p.m.; and those of nearly all the other American and Canadian stations from the temperatures at 7 a.m., 2 p.m. and 9 p.m., double value being attached to the 9 p.m. observation,—the number 4 being used as a devisor in order to correct the very slight excess above the true mean which these hours would otherwise give. With equal conditions of exposure the methods adopted of obtaining the average temperature should show the true average to within a small fraction of a degree of Fahrenheit's thermometer, and with few exceptions the conditions are sufficiently uniform to admit of comparisons being instituted. In the cases, however, of Chicago, and a few other American cities, the stations are so located in the


MAP
Showing the
mals for January
iod of Nine Years. (1874 - 82)
10°
12°
Rockliffe
Ottawa River
OTTAWA
Cornwall
Brockville
15°
18°
Kingston
Belleville
20°
25°
Oswego
Rochester
Buffalo
25°
30°
Philadelphia
40
45
NEW YORK
ONTARIO
PENNSYLVANIA
MARYLAND
VIRGINIA
GRIP CO. ENG'RS.


MAP
Isothermals for January
O N T A R I O
M I C H I G A N
I O W A
I L L I N O I S
I N D I A N A
O H I O
K E N T U C K Y
M I S S O U R I
P E N N S Y L V A N I A
W E S T V I R G I N I A
V I R G I N I A
L A K E
M I C H I G A N
L A K E
E R I E
10°
12
15
18
20
22
24
25
30
DES MOINES
SPRINGFIELD
INDIANAPOLIS
COLUMBUS
Cleveland
Detroit
Windsor
Sandusky
Buffalo
Toronto
Chicago
St Louis

very heart of the business quarters that the radiation of heat from surrounding buildings and the prevention of radiation into the atmosphere through the presence of smoke and other vapour, makes the averages reported higher than would properly represent the mean of the suburbs or of the country immediately around. The averages for these few stations, which are known to be imperfect, are given in the tables, but in drawing the isothermals they have been in some measure ignored. The means reported appear from observations in neighbouring places to be from one to three degrees, or even more, too high. They have, however, in some measure, been taken into account, and the isothermal lines deflected in a few instances—noticeably at Keokuk, in Iowa, and at St. Paul, in Minnesota—to the northward of the course which the temperature of neighbouring stations and other considerations would indicate as the true course. Reference to the unsatisfactoriness of some of the exposures of the thermometer are made by the chief signal officer of the United States in his last annual report.

The records of temperature and the isothermals based upon these prove that, latitude for latitude and altitude for altitude, or even despite lower elevation above sea level in the Western States, the mean temperature of January in the Province of Ontario and in the lake region generally, is much higher than in the basin of the Mississippi and Missouri rivers. Southern Ontario is as warm in January as northern Missouri, two hundred miles farther south; and northern Ontario, east of Lake Superior, is as warm as central Iowa, nearly four hundred miles nearer the equator.

Before referring at greater length to the remarkable differences in climate between the lake region and the central regions of the continent, a brief explanation of the general causes which produce them is in place.

The impression in the minds of many persons that the Western States are milder in winter than eastern Canada or New England, is partially due to a misunderstanding, or a too-extended application of the popular saying that "the climate becomes warmer as one proceeds west." The popular saying is true, but with important limitations. The western side of America is much warmer on the same parallels than the eastern side. Vancouver Island has as mild a winter as Virginia, and Sitka in Alaska, is as mild as Delaware. The same rule holds true in regard to the old world, the coasts of Norway being milder in winter than northern China, and St. Petersburg, on the 60th parallel, than the Amour on the 50th.

The explanation is found chiefly in the drift of the atmosphere, and the consequently unequal influence of the waters on the east and on the west side of a continent. The drift of the atmosphere in temperate latitudes is from the west. Thus the comparative warmth of the Pacific Ocean in winter, is borne far inland to the Bow river and Saskatchewan plains, in the Canadian Northwest and in the United States, to the eastern flanks of the Rockies, where it greatly mitigates the Arctic cold which the elevation of these districts tends to produce. With the eastward drift of the atmosphere, too, the areas of low barometer, cyclones, or "warm waves" as they are variously called, move, intensifying the effect of the drift of air from the west. The influence of the Atlantic, on the other hand, but slightly affects the eastern part of the continent. No drift of the mild atmosphere overlying it, can set westward for a great distance. The only winds which blow westward are the raw east winds drawn in for a few hundred miles towards cyclonic or storm areas advancing from the west. These east winds, however, are mere surface currents incidental to the indraught of storms. Often in the lake regions, and always in the Mississippi valley, none of the air in the east wind comes from so far east as the Atlantic Ocean. The moderating influence of the Atlantic, therefore, rapidly decreases as the east coast is receded from, and it entirely ceases a few hundred miles inland.

The unequal influence of the two oceans, it may be seen, would tend to throw the meridian of greatest winter cold towards the eastern side of the continent, where the west wind, having parted with its warmth, has become chilled by the great radiation of heat which occurs in the interior of the continent. But here the great lakes interpose a protecting influence, their open water warming the west and north-west winds as they pass over them. The result is that the meridian of greatest cold lies, not where the influence of the Atlantic ceases, but in the valley of the Mississippi and Missouri rivers.

The belt of greatest relative cold in winter, latitude and elevation considered, stretches down from the Red river, a little east of the Mississippi, across western Minnesota, eastern Dakota, western Iowa, eastern Nebraska, and eastern Kansas, southward into Texas. Towards this central belt, the winter isothermals trend south-westerly from the Atlantic and the great lakes, on the one side, and on the other south-easterly from the Pacific, though in the latter case the isothermals are very irregular owing to great differences in elevation which pertain to the Rocky Mountains and the adjacent table-lands.

The very reverse, from analogous causes, occurs in summer. The development of heat in the interior of the continent attains in the neighbourhood of this belt its maximum effect. The modifying influence of the Atlantic is too limited to reach so far westward, and the Pacific is too far distant for even its more extended influence to have any mitigating effect. Against the eastward drift of the hot air of the interior, the great lakes interpose a protection, as they do in winter against the cold, and throw back to the basin of the Mississippi and Missouri the belt of greatest relative heat. Towards this belt, and trending north-westward, instead of south-westward, as in winter, the summer isotherms run from the eastern coast, in large measure restoring the isotherms of the year, in the region embraced by the accompanying map, to some conformity to the parallels of latitude, but making the climate of the Western States one of excessive extremes.

So marked is the influence of the great lakes in modifying the cold of winter that the January isotherm of 10°, which in Iowa descends to the 43rd parallel, reaches in the neighbourhood of Lake Superior to beyond the 48th, or 380 miles further north. Even where the lake influence is comparatively reduced by distance, as in the Ottawa valley, this isotherm occupies a much more northerly position than in the West, the January mean at Rockliffe on the Upper Ottawa being as high as in Northern Iowa, 200 miles further south.

The isotherm of 15° entering the Province from the State of New York near latitude 44° 30′, rises gradually through Muskoka, Parry Sound and Algoma districts to the 46th parallel, whence from the neighbourhood of Sault Ste. Marie it strikes northward on the east side of Lake Superior to beyond the 48th parallel, giving the coasts of Lake Superior as warm a January mean as Central Iowa in latitude 42° or about 350 miles further south.

The isotherm of the mean temperature of 20° for January, entering the Province near the eastern extremity of Lake Ontario, north of the 44th parallel, follows the central watershed between the basin of Lake Ontario and the basin of Lake Simcoe and the Trent river to the highlands of the western peninsula. Skirting these highlands at an elevation of about 1200 feet above the sea to the borders of the Georgian Bay, the line curves with the shore line, north, and then west, to the 46th parallel, whence descending the western shore of Lake Michigan it crosses to the Mississippi near the northern border of Illinois, and still further pursuing its south-westerly trend over the great plains, almost reaches the 40th parallel in north-western Missouri. There is thus a difference of nearly 400 miles between the position of this isothermal in the Lake country and in the Mississippi basin. Southward of this line a large and comparatively elevated portion of the interior of Michigan, between the parallels of 46° and 43°, is circumscribed by the isotherm of 20°, while a small area in Northern Illinois, also southward of this isotherm, has a mean temperature below 20°.

The January mean of 25°, ascending from Pennsylvania to the west end of Lake Erie, skirts the Canadian side of that lake to Detroit, whence, descending southwards into Ohio, it crosses the north-western part of Indiana and re-enters Michigan, emerging on Lake Michigan, near Grand Haven. From the south end of that lake it passes from Indiana through Central Illinois and Missouri to Central Kansas. Northward of this line, and circumscribing a large oval around the low-lying borders of Lake Ontario, the isotherm of 25° again appears, with a long narrow belt of land on its warmer southern side, fringing the south shore of Lake Ontario from near Hamilton to Oswego. It is not improbable that this isolated line should connect, on either side of the Niagara river, with the line of corresponding temperature along Lake Erie, but the absence of meteorological stations between Fort Erie and Lake Ontario does not admit of this connection being confidently made. The range of this isotherm between Lake Ontario and eastern Kansas, where it reaches the 39th parallel, is about 4½ degrees of latitude, or over 300 miles.

The January isotherm of 30° lies entirely south of the great lake region. It leaves the Atlantic at New York city, and after running south-westerly, near Philadelphia, pursues an irregular course across the Alleghany mountains, and returns to the 41st parallel in western Pennsylvania, whence it pursues a comparatively undisturbed south-westward course across central Missouri to the southern boundary of Kansas, on the 38th parallel.

The districts in which more than half the people of Ontario live are embraced between the January isotherms of 20° and 25°. These districts have, therefore, a similar mean January temperature to central and southern New York, central Pennsylvania, southern Michigan, northern Illinois, northern Kansas, and small portions of southern Iowa, south-eastern Wisconsin, northern Indiana, and north-western Ohio.

The climate of northern and north-eastern Ontario corresponds in its January mean with Iowa, central and northern Michigan, and southern Wisconsin.

The highlands of the western peninsula, occupying those portions of the counties of Simcoe, Dufferin, Wellington, Waterloo, Perth, Huron, Bruce and Grey, between the elevations of 1,200 and 1,700 feet above the sea, vary in mean temperature in January from 20° to 17°. A corresponding climate covering, however, a much larger area, lies at slightly lower elevation in Michigan, between lakes Michigan and Huron. The same mean temperature for January is found west of Lake Michigan in southern Wisconsin, northern Illinois and southern Iowa.

Fort Erie in Ontario, Catawissa in Pennsylvania, Detroit in Michigan, Lafayette in Indiana, and Yates in central Kansas, average between 25° and 26° in January.

Hamilton, Goderich, Simcoe and Windsor in Ontario, have a January mean of between 24° and 25°, or the same as Port Jarvis in south-eastern New York, Rochester, in western New York, Wanseon in Ohio, Peoria in Illinois, and Topeka and Manhattan, Kansas.

The January of Toronto and London, in Ontario, nearly 23°, corresponds with the January of Wellsborough in Pennsylvania, Lansing in Michigan, and Lawrence in Kansas; and that of Galt and Saugeen in Ontario, with Franklin in Pennsylvania, Hillsdale in southern Michigan, Milwaukee in Wisconsin, and Corning in Missouri.

Kingston, Peterboro' and Durham—the last about 1,400 feet above the sea—have the same January mean as Palermo in New York, Rockford in Illinois, Monticello in Iowa, and Fremont in Nebraska.

Maimense on Lake Superior, and Egremont on the highest land in western Ontario, are as mild in January as Riley in Illinois, and Curryville in Missouri, while Rockliffe on the Upper Ottawa has a somewhat milder January than Cresco or Humboldt in northern Iowa.

The following tabular statement of the mean temperature for January of a number of meteorological stations in Canada and the United States, furnishes opportunities for interesting comparisons, illustrative of the general curvature northward of the isothermal lines in the neighbourhood of the great lakes:

IOWA.

	°		°		°
Ames	12.2	Nora Springs	18.1	Iowa Springs	13.1
Clinton	17.5	Dubuque	20.7	Logan	19.7
Cresco	8.0	Humboldt	8.8	Muscatine	19.2
Des Moines	18.3	Independence	12.7	Davenport	22.6
Des Moines	15.9	Indianola	16.7	Keokuk	26.1
Monticello	18.1	Iowa City	19.4		

NEBRASKA.

	°		°		°
Omaha	22.0	Genoa	17.8	Clear Creek	19.2
De Sota	18.1	Fremont	18.8	North Platte	21.3

MISSOURI.

	°		°		°
Corning	21.4	Pierce City	35.4	Clinton	29.6
St. Louis	33.1	Curryville	17.4		

KANSAS.

	°		°		°
Lawrence	23.1	Leavenworth	27.1	Cresswell	26.5
Topeka	24.2	Holton	23.4	Fort Scott	30.0
Yates Centre	25.8	Manhattan	24.4	Dodge City	27.3

ILLINOIS.

	°		°		°
Elmira	15.4	Collinsville	29.9	Peoria	24.5
Morrison	17.9	Charleston	30.7	Mattoon	28.0
Bunker Hill	28.3	Riley	17.6	Springfield	28.9
Champaign	26.8	Rockford	18.7	Cairo	36.4

INDIANA.

	°		°		°
Lafayette	25.5	Logansport	26.3	Indianapolis	30.5
Wabash	26.3	Fort Wayne	27.0		

SOUTHERN WISCONSIN.

	°		°		°
Milwaukee	21.6	Madison	19.8	Franklin	19.3
Neillsville	13.4	Lacrosse	17.8	Beloit	20.0
Embarrass	14.7	Ripon	16.8		

OHIO.

	°		°		°
Cleveland	27.3	Columbus	31.5	Margaretta	27.6
Wauseon	24.1	Cincinnati	34.8	Canal Dover	29.4
Westerville	28.3	Toledo	28.2	College Hill	32.3
North Lewisburg	28.0	Ruggles	26.7	Portsmouth	34.3
Jacksonburg	29.3	Sandusky	28.2		

PENNSYLVANIA.

	°		°		°
Erie	28.7	Williamsport	28.9	Wellsborough	23.1
Franklin	21.7	Bloominggrove	25.6	Pittsburg	31.1
Catawissa	25.8	Dyberry	20.9	Philadelphia	31.7
Westchester	28.4				

NEW YORK.

	°		°		°
Buffalo	25.4	Cooperstown	20.4	Albany	23.3
Oswego	26.4	Johnston	19.3	Port Jarvis	23.7
North Volney	20 5	Rochester	24.8	Factoryville	20.3
Palermo	18.6	Ithaca	24.1	New York	30.3

MICHIGAN.

	°		°		°
Detroit	25.1	Kalamazoo	23.8	Reed City	19.3
Grand Haven	26.0	Ionia	20.0	Otisville	22.1
Escanaba	15.6	Port Huron	22.9	Washington	22.4
Traverse	18.5	Alpena	19.2	Hillsdale	21.5
Lansing	22.7	Marquette	18.2		

MINNESOTA.

	°		°
St. Paul	15.1	St. Vincent	-3.0

PENINSULAR ONTARIO.

	°		°		°
Windsor	24.3	Simcoe	24.4	Conestogo	19.5
Port Stanley	23.7	Fort Erie	26.3	Egremont	17.7
Vienna	23.3	Woodstock	21.0	Galt	21.6
Welland	24.2	London	22.7	Elora	19.0
Brantford	22.5	Granton	21.5	Saugeen	21.7
Hamilton	24.6	Birnam	22.7	Brampton	21.5
Strathroy	22.5	Guelph	20.6	Durham	18.3
Pelee	24.9	Goderich	24.4	Stayner	19.3
Port Dover	23.6	Point Clark	23.9		

CENTRAL ONTARIO.

	°		°		°
Toronto	22.7	Peterboro	18.8	Barrie	19.2
Deseronto	18.9	Belleville	19.4	Lindsay	16.5
North Gwillimbury	20.7	Kingston	18.6	Norwood	17.4
Newmarket	18.7				

NORTH-EASTERN ONTARIO.

	°		°		°
Brockville	14.7	Pembroke	10.4	Fitzroy Harbour	11.3
Ottawa	11.6	Cornwall	12.9		

NORTHERN ONTARIO.

	°		°		°
Penetanguishene	17.4	Little Current	15.2	Parry Sound	16.9
Beatrice	14.4	Port Arthur	8.4	Manitowaning	16.9
Rockliffe	10.0	Gravenhurst	16.2	Maimense	17.2

From the American Signal Service report for January, 1884, is taken the following statement of January mean temperature for a series of years in the Signal Service districts around the great lakes and to the westward. The latitude of these districts is added to show more clearly the amelioration of climate produced by the lakes. The lower lake region embraces the basins of lakes Erie and Ontario, from Cornwall westward to beyond Detroit; the Upper Lake region, the basins of lakes Huron, Michigan and Superior. The Upper Mississippi Valley, is about 200 miles broad and extends from Cairo, Illinois, to St. Paul. The Missouri Valley comprises a similar breadth from southern Missouri to Fort Sully. The extreme North-west or middle Missouri Valley includes Dakota and eastern Wyoming, from Yankton northward. The latitude and mean temperature of January for these districts are as follows :

	Extent.	Mean Latitude.	Mean Temperature.
Lower lake region	41° to 45°	43°	25° 1
Upper Mississippi	37° to 45°	41°	23° 9
Lower Mississippi	37½° to 45°	41° 15	19° 1
Upper Lake region	41° to 49°	45°	19° 6
Middle Missouri	41° to 49°	45°	5° 1

In general, it may be said that the mean temperature of Ontario in January is at high as that of the Mississippi and Missouri basins, over 250 miles nearer the equator.

In modifying the extremes of temperature in winter, the influence of the great lakes is even more potent than in raising the general average heat of winter. Amongst the phenomena which conduce to this result is the common formation over the lakes of areas of low barometer—that is areas of warmth, rain or snow, and cloudiness—during the coldest weather of winter. When a cold wave, advancing from the west, reaches the great lakes, the difference between the temperature of the land and that of the large surfaces of open water on the lakes is so great that the upward motion of the warm lake air is accelerated, and a cyclonic area forms and travels eastward with its attendant phenomena of latent heat set free by precipitation of moisture, and radiation from the earth checked by vapor in the air. These slight depressions sometimes form twice, or even three times during the advance of a high barometric area or cold wave, which, thus retarded over the lakes, pours its refrigerating atmosphere around and past the lake region to north or south. These lake-bred storms are amongst the causes which make the snow of the lake country deeper than that of the Mississippi valley, but though thus increasing the wintry appearance of the landscape, they have an important influence in lessening the cold.

The minimum temperatures of Ontario differ greatly according to distance from, and situation in regard to the lakes; but even the Ottawa valley, exposed to the full rigour of northern winds, and less within the influence of the lakes than any of the other settled parts of the Province, does not usually experience as low temperatures as the Mississippi valley in similar latitudes. In the lake region proper, the range of the thermometer downwards is not only less than in similar latitudes to the west of the lakes, but less than in portions of the west where the mean temperature of January is equally moderate.

Along a considerable portion of the lake borders, the average lowest reading of the thermometer in January is little or not at all below zero. In the extremes, embraced within the nine years' period (1874 to 1882), the downward range was much less than in the west at latitudes even four hundred miles nearer the equator.

Some of the milder parts of the Province have experienced no greater cold in this month than 12° below zero, and in a considerable area the maximum cold has not exceeded 20° below zero. In Indiana the mercury in the same period has ranged as low as–30° ; in parts of Illinois–30° to–40° ; in Iowa,–30° to–40°, and in the colder parts of Missouri to below–30°.

Parts even of Texas, Arkansas and Kentucky record lower temperatures than the Niagara district or the south-eastern shores of Lake Huron. The lowest temperature recorded at Toronto in January during the past twelve years is–18° 5 ; at Windsor–19° 5 ; at Hamilton–20°5. In the same period temperatures are recorded at Cairo, Illinois, of–16° ; at St. Louis, Missouri,–21° 5 ; at Sedalia, in the same state,–33°, at West Leavenworth, Kansas,–29° ; at Louisville, Kentucky,–19° 5 ; at Indianapolis, Indiana,–25° ; at Lafayette, Arkansas,–17° ; at Omaha, Nebraska,–38° ; at Champaign, Illinois,–39°, and at Fort Benton, Dakota,–55°.

East of Lake Ontario, along the St. Lawrence and Ottawa, the following temperatures have been recorded : Cornwall,–28° 8 ; Montreal,–26° 4 ; Brockville,–25° 7, and Pembroke,–40 °7. But in these districts the abundant snowfall renders low temperature less injurious than in the Western States, where the irregularity of the winter season usually prevents the duration of a snow covering for more than a few days or weeks at a time.

The effect of the lakes on climate is very varied in degree and character, according to the measure of protection which these bodies afford against the warm and cold winds of winter. The eastern side of any lake is warmer than the western, and the southern than the northern. Openness to the south-west wind, which in winter is sometimes very cold and sometimes very warm, causes great changeability of climate. The interposition of a lake against the south wind, favours steadiness of climate by lessening the warmth of that wind, which is usually both in summer and winter warmer than the water of the lakes.

The application of these obvious facts explains many of the peculiar characteristics of the climates of the lake region.

An exceptionally mild area is found to the south-west of Lake Huron, the breadth of that lake protecting its eastern side from the west and north-west, and a lesser measure of protection against the north being afforded by the north-easterly trend of the shore along the county of Bruce. The mean temperature of January in this area exceeds 24°, and is warmer than the country immediately southward, which lies exposed to the west and north-west winds blowing across the breadth of Michigan.

A similar warm area lies at the south-east end of Lake Michigan, and around Oswego at the south-east end of Lake Ontario.

A somewhat similar area also is found in Algoma for a considerable distance north of Sault Ste. Marie, though there, as at the east end of Lake Ontario, comparative openness to the north admits of occasional excessive descents of the mercury below zero.

In some parts of the eastern coast of Lake Superior, however, the trend of the coast east of north gives limited areas protection against the north wind, and a corresponding freedom from very low temperatures. The records of Maimense show that this coast is as mild in January as the counties of Victoria and Leeds in central and eastern Ontario, over 150 miles further south, or than parts of Iowa and Illinois, 350 miles to the southward.

The Niagara district, protected from cold winds from the north-westerly semi-circle, by Lake Ontario, and partially from cold south-westerly winds by Lake Erie, has a January temperature ranging from about 24° to probably 27°, and an immunity from cold enjoyed by no other district in the region of the great lakes or in the Mississippi valley north of the 37th parallel. If partially protected against the occasionally unseasonable warmth of the south-west wind, it is open to warm south-easterly winds and is but partially protected against the south winds. Hence the winter climate is more subject to unseasonable warmth than the Goderich district.

The counties from the foot of Lake Erie to the St. Clair and Detroit rivers are in large measure modified by the lakes to the north, south-east and west, but being open to the great warmth at times and cold at others, of the south-west wind, are more variable in winter than the northern parts of peninsular Ontario or than the north shore of Lake On-

tario in the vicinity of Toronto. While the general average of January in this district is higher than at Toronto, Windsor experiences as low temperatures as that city and lower temperatures than Goderich, a degree and a half of latitude further north.

In the heart of the western peninsula rises a remarkable plateau, attaining in the County of Grey an elevation of 1,700 feet above the sea. This mountainous elevation has of course a considerable effect in reducing the mean temperature, but still the influence of the great lakes is such that the January mean of the coldest parts—a little less than 18°—is considerably higher than that of the Mississippi and St. Lawrence valleys in similar latitudes, but at much lower levels. On these heights, especially on their western slopes, the north-west and westerly winds blowing over Lake Huron, and absorbing moisture from its open water, deposit that moisture in excessive rain and snow, and the latent heat thus set free has a considerable influence in preventing the low extremes which these winds would otherwise bring. The mercury at Durham, near the summit of this plateau, does not appear to fall any lower than in central Illinois and Missouri.

The influence of the Georgian Bay, though considerable, is diminished by the existence of a belt of islands around the western and northern coasts. These islands allow of a broad fringe of ice forming along the shore, and thus the temperature of the north-west wind is little or not at all modified. The districts of Muskoka and Parry Sound, though greatly modified in winter climate by the waters west of them, are thus open to north-west winds, as well as to the less frequent north winds, and therefore occasionally experience temperatures considerably lower than in most of peninsular Ontario.

Eastward to the Ottawa the lake influence decreases. This is compensated in part by the lower levels of the Ottawa valley, and probably also by the influence of the Atlantic.

The north shore of Lake Ontario enjoys comparative exemption from unseasonable extremes of warmth in winter, through the protection afforded by the lake from south and south-west winds. The low level of the lake is also conducive to warmth, and towards the western part of this belt of land, the influence of Lake Huron and the Georgian Bay prevents the occurrence of excessively low temperatures, an effect increased by the presence of the height of land known as the Oak Ridge.

The influence of the lakes on precipitation affords over much of the Province additional protection against cold. The prevalent winds, the west and north-west, are excessively dry, and therefore in passing over the lakes absorb a large amount of moisture which is precipitated on the land on their eastern sides. Thus, the Lake Huron counties and the high plateau of the peninsula, with the districts of Parry Sound and Muskoka, and the country along the eastern side of Lake Superior, have an excessive snowfall. The southern part of the peninsula and the northern side of Lake Ontario obtain little snow from the lakes, the moisture from Lake Erie falling around Buffalo and other parts of the eastern coast, while that raised by the west and north-west wind from Lake Ontario falls in Northern New York. In the counties north of Lake Erie, the snowfall is very light, and owing to the frequent occurrence of mild weather the ground is usually bare, or almost so, during most of the winter.

The chief advantage which Ontario, in common with the lake region in the United States, derives from its greater mildness and more abundant snowfall, is in regard to the growth of fall wheat and of fruit.

Mr. Chamberlain, secretary of the Ohio Board of Agriculture, states that the northern boundary of profitable fall wheat culture west of the Mississippi river corresponds with the northern boundaries of Missouri and Kansas, that is, about the parallel of 41°. In Ontario and Michigan the line extends north of latitude 45°

But it is especially in fruit-growing that nature points out to the agriculturists of the lake region a profitable field for enterprise. In no other districts between the Alleghany and the Rocky Mountains, north of Tennesee, does the peach enjoy so great an immunity from injury by frost as in the peach belts on the eastern sides of Lakes Michigan and Huron and in the neighbourhood of Lakes Erie and Ontario. The area in Ontario of extensive peach culture is bounded by the January isotherm of 23°, though profitable orchards are found in some localities where the January mean is as low as 22°. On the warmer side of the isotherm of 23° the peach can almost everywhere in Ontario be cultivated with success, and this warmer side includes several thousand square miles of territory. It is not, how-

ever, the mean temperature of the coldest month of the year that limits or allows the cultivation of this important fruit; it fails to be profitable in the Western States over large areas where the January mean is much higher than 23°, and its success for periods of several years in localities in this Province where the mean is much lower than that temperature, shows that the chief limitation on the cultivation of the peach, where the summer and autumn is as warm as in most of Ontario, is the too frequent occurrence of intensely severe frosts, especially after autumns too cool to allow of the perfect maturing of the new growth of the tree. What minimum temperature suffices to limit the cultivation of the peach under the other conditions of our climate, experience has not yet shown; but orchards on well-drained soils have withstood temperatures of even 30° below zero. The peach belts of the Province may be said not to be subject to lower temperatures than about 20°. It is not improbable that experiments being made with new and hardy varieties of the peach, may result in a very considerable extension of the peach area of Ontario.

Such winter cold as even the coldest of the cultivated parts of Ontario are subjected to does not apparently prevent the profitable growth of the grape. In northern and eastern Ontario, the abundance of snow in winter permits of protection from the effect of the lowest temperatures experienced there. In southern and south-western Ontario, the laying down of the vines is not necessary, and in many localities this would be injurious rather than beneficial. Thus, in no part of Ontario is the winter cold a practical obstacle to viti-culture. The vine in the Ottawa valley bears abundantly as well as in south-western Ontario, and better than in the Mississippi valley where the January mean is considerably higher, but where the frosts are quite as severe, and where the lack of snow makes protection difficult. The limit on profitable culture is in regard to summer heat, which, however, is sufficient in almost every part of the Province south of the 46th parallel to permit of several good varieties of the grape ripening. The summer of much of the Province is adapted in the very largest measure for grape-growing; and even in localities where in occasional years the grape fails to mature well, the climatic disadvantage is no greater than in the celebrated wine districts of the Rhine. The long immunity from frost and severe cold enjoyed in the lake regions is not the only climatic advantage which this Province has in regard to grape culture. The mean temperature of summer nowhere exceeds 71°, a temperature that with the very moderate amount of rainfall and moisture which prevails in the Ontario summer, gives comparatively security against mildew, which, owing to great heat and moisture combined is a most serious obstacle to viti-culture in the Eastern States and the Mississippi valley south of the 41st parallel. The climatic conditions of the lake regions are such, in fact, as to make a large portion of Ontario, Michigan and New York superior, for the culture of the vine, to any other large section of this continent, with the very doubtful exception of Southern California.

The same influences which make the climate of Ontario admirable for grape culture also make it, as is well known, favourable in the highest degree to apple-growing, which here is profitably carried on much further north than in the Mississippi valley.* How far north beyond the already cultivated districts the growth of the apple can be carried, experience has not determined. So far as conditions of winter climate are concerned, it is probable that the northern limit should not be placed short of the January isotherm of 10°, which trends north-westerly from the Upper Ottawa to the northern extremity of Lake Superior. The portions of the eastern side of that lake for fifty miles north of Sault Ste. Marie, enjoy a winter climate as moderate as that of Lindsay, and warmer than that of Brockville, and with a summer which, if comparatively cool, has a very long exemption from frost, they afford a promising field for experiment with the apple and a variety of small fruits.

*According to the Report of the Minnesota Horticultural Society apple trees throughout that State and Iowa were very seriously damaged by the cold weather of last winter, nearly all the young wood being found discolored in the spring. Prof. Budd, Secretary of the Iowa Horticultural Society, says in reporting for his State, that "absolutely no wood is sound except of the Siberian and Russian sorts." In Ontario, on the other hand, the young wood and the fruit buds came through the winter unscathed, and the outlook for an abundant crop of apples has not been brighter in many years.—A. B.

STATISTICS OF

THE WEATHER, AGRICULTURE, LABOUR & WAGES,

AREAS, LOCAL TAXATION, POPULATION, ETC.

THE

TABLE No. I.—Showing for each month and the year the highest, the lowest, at the principal stations in Ontario

MONTH.	TEMPERATURE.	GODERICH.		WINDSOR.		SIMCOE.		STRATFORD.	
		1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
		°	°	°	°	°	°	°	°
January	Highest	42.3	41.1	48.9	44.3	44.8	41.4	44.0	41.2
	Lowest	−10.5	-6.5	−13.4	−11.7	−35.5	−8.0	−21.8	−20.6
	Mean highest	22.3	24.1	25.2	27.1	24.5	26.4	21.7	26.1
	Mean lowest	9.8	11.2	9 0	9.6	7 3	9.9	4 1	4 2
	Monthly mean	18.8	17.6	17.4	18.3	16.3	18.2	13.9	14.2
February	Highest	47.5	51.4	57.9	57.5	50.8	57.0	46.3	48.1
	Lowest	− 9 0	- 8 0	−7.8	−5.2	−10.5	− 9.0	−12.8	−18 4
	Mean highest	29.8	22.7	31.0	31.0	34.3	30.0	30.1	26.7
	Mean lowest	16.1	11.8	15.9	13.0	16.4	11.6	12.1	6.3
	Monthly mean	21.9	18.9	26.5	22.0	25.0	20.8	21.0	16.5
March	Highest	55.2	44 1	63 4	61.9	56.8	49.4	52.8	46.6
	Lowest	− 8.0	−1.0	−1.2	−10.3	−12 5	−7.0	- 23.0	−16.0
	Mean highest	35.0	30.1	34.8	38 4	32.5	34.2	34.8	31.9
	Mean lowest	20.5	13.4	18.8	15.7	17.1	13.7	15.5	6.0
	Monthly mean	27.0	21.6	33.1	27.0	30.0	23 9	26.5	19.2
April	Highest	73.0	80.3	70.8	86.0	71.8	75.8	72.2	77.5
	Lowest	25.0	13.0	24 7	19.3	22 0	15.0	19.3	2.0
	Mean highest	47.5	48.3	46.6	55.8	44.3	52.2	49 4	49.3
	Mean lowest	33.7	31.9	29.0	33.4	26.6	31.5	30.1	29 2
	Monthly mean	39.5	39.5	44.1	44.6	41.2	41.8	40.6	39.4
May	Highest	78.3	77.5	87.3	80.5	80.8	78.8	78.2	76.5
	Lowest	33.0	34.0	32.2	30.3	28.0	24 0	28.1	28.9
	Mean highest	60.9	58 0	69.4	64.0	63.1	62.8	63.0	59.8
	Mean lowest	44 9	41.2	44.3	41.7	42.5	40.2	41.9	39.4
	Monthly mean	52.7	51.2	58.5	52.9	55.1	51 5	52.8	49.6
June	Highest	86.1	82.5	93.1	88.1	88.8	85.8	86.9	85.0
	Lowest	50.0	36.0	47.8	37.4	41.3	34.9	44.5	33.2
	Mean highest	78.0	72.2	81.7	73.0	78.5	75.2	77.4	73 0
	Mean lowest	58.8	54.6	56.4	55.3	52.3	53.2	52.9	53.4
	Monthly mean	67.8	63.4	70.4	64.2	67.8	64.2	68.0	63.5
July	Highest	85.7	84.4	90.7	91.1	85.8	85.0	86.2	86.7
	Lowest	45.0	45.0	45.8	49.2	42.8	43.8	43.0	42.5
	Mean highest	73.3	74.0	81.2	80.7	76.6	77.4	74.2	75.6
	Mean lowest	56.2	57.6	58.2	54.5	54.8	56 6	52.1	55.5
	Monthly mean	65.2	66.5	70.0	67.6	66.1	67.0	64.0	65.6
August	Highest	91.3	86.7	94.0	93.5	88.3	87.8	90.0	85.0
	Lowest	46.5	48 1	40.6	48 4	39.9	39.8	36.6	41.5
	Mean highest	76.1	73.1	80.9	82.2	77.3	75.7	75 2	74.4
	Mean lowest	57.0	56.2	56.1	57.5	53.6	52.6	51.2	50.2
	Monthly mean	67.4	64.5	69.9	68.0	66.6	65.1	64.3	62.5
September	Highest	90.2	77.3	93.1	88 1	87.8	79.8	88.9	79.7
	Lowest	38.9	35.0	38.6	33.8	29.9	29.0	28.6	29.4
	Mean highest	73.0	65.6	80.3	71.8	74.8	67.1	72.2	65.4
	Mean lowest	55.2	48.7	55 3	48.8	52.9	45.3	51.0	44.3
	Monthly mean	64.9	56.8	68.3	60.1	65.1	56.2	61.5	53.8
October	Highest	74.3	76.8	87.3	77.8	79.8	85.9	78.4	76.5
	Lowest	28 6	27.0	23.1	28.5	23.9	30.0	22.5	24.2
	Mean highest	57.9	53.4	63.5	53.7	60.1	58.6	57.2	52.9
	Mean lowest	43.4	38.4	41.8	38.5	39.4	41.4	39.9	36.5
	Monthly mean	51.1	45.8	53.3	46.1	51.0	50.0	48.5	43.8
November	Highest	54.1	64.3	61.8	65.6	61.7	63.8	71 1	59.0
	Lowest	16.6	16.0	13.2	17.0	14 0	13.0	9.9	7.1
	Mean highest	40.4	45.1	45.5	49 6	43.4	47.7	44.3	43.1
	Mean lowest	29.7	33.0	27.3	32 0	26.9	30.9	25.3	28.4
	Monthly mean	35.4	38 5	36.2	40.5	35.2	40.9	32.7	36.1
December	Highest	53.7	51.9	55.9	56.9	54.9	53.8	58.1	49.2
	Lowest	− 6.7	4.0	− 8.8	5.0	−12.5	− 2.0	−17.0	2.3
	Mean highest	31.5	34.0	33.0	38.0	33.0	36 1	30.4	31.3
	Mean lowest	20.9	21.5	17.6	19.4	17.6	19.0	14.9	18.6
	Monthly mean	26.9	26.8	25.8	28.6	26.6	28.2	23.3	24.6
The year	Highest	91.3	86.7	94.0	93.5	88.8	87 8	90 0	86.7
	Lowest	−10.5	− 8 0	−13.4	−11.7	−35.5	− 9.0	−21.8	−20.6
	Annual mean	44.9	42.6	47.8	45.0	45.5	44.0	41.9	40 7

WEATHER.

the mean highest, the mean lowest and the mean temperatures as recorded during the years 1883 and 1884.

Hamilton.		Toronto.		Barrie.		Peterboro'.		Cornwall.		Pembroke.	
1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
°	°	°	°	°	°	°	°	°	°	°	°
45 3	45.8	40.1	40.5	42.9	38.6	37.2	38.9	42.3	43.8	44.6	39.6
—23.0	—11.5	—13.1	— 7.8	—32.1	—28.1	—17.0	—22.9	—31.3	—22.0	—34.9	—34.0
25.9	28.5	23.1	25.1	22.1	22.4	20.5	23.8	16.8	19.1	16 0	18.8
5.6	6.9	7.6	9.3	— 0.0	0.4	2.7	0.5	— 2.0	— 4.2	— 9,1	— 4.5
16.7	18.6	16 0	17.5	13.2	11.4	13.1	12.4	8.0	7.5	4.8	3.8
46.8	54.8	42 9	44.1	42.6	46.6	39.2	45.8	48.1	50.9	40.6	46.6
—10 5	— 8.5	— 7.2	—10.5	— 9.3	—13.8	—11 0	—18.9	— 6.3	—22.5	—17.0	—32.0
35.0	31.6	30.7	27.4	29.5	25.8	25.8	24.8	27.4	22.6	24.8	22.5
13.9	11.7	15.7	11.3	10.2	4.6	7.8	4.3	8.5	5.0	2.8	— 0.1
25.2	22.5	23.2	20 1	20.1	15.2	20.9	14.9	17.6	14.2	14.5	10.6
57.3	49.8	49.3	46.1	49.6	47.6	52.3	44.8	49.4	44.1	55 6	46.0
—10.0	— 7.1	— 7.0	— 5.8	—18.9	—13.3	— 20.0	—10.9	—18.6	—12.8	—24.0	—16.4
41.2	34.8	35.1	31.2	33.5	30.5	32.5	30.3	33.1	28.0	34 8	27.8
21.5	11.8	20.5	11.8	16.1	5.7	14.9	6.3	16.0	5.9	13.5	0.5
30.7	24.6	28.0	21.9	26.6	18.1	27.5	20.7	24.8	16.6	24.3	15.5
75.2	79.7	67.8	64.6	67.6	63.6	72.3	63.7	71.8	72.1	76.1	74.0
25.0	8.8	25.1	11.9	16.8	4.1	25.0	5.0	24.7	17.6	21.2	1.6
51.9	50.5	48 5	46.8	47.7	45.2	50.4	48.1	50.2	51.7	51.4	47.4
30 3	27.4	33.2	29.6	28.2	27.1	33.2	27.0	33.0	31.7	30.8	26 0
41 6	41.0	40.9	38.3	37.9	36.2	41.6	37.5	41.2	37.6	39.9	36.2
84.0	80.8	75.7	72.7	80.1	77.1	80 4	75.7	78.5	84.1	86 3	84.6
32.0	30.1	28.0	31.1	28.5	28 5	30.1	30.1	30.0	32.7	31.0	30.1
65.6	62.7	59.9	58.3	61.0	57.6	64.6	61 8	63.0	61.8	64.0	62.2
38.9	38.7	41.9	40.2	40.6	38.4	43.8	39.6	42.5	42.5	42.0	39 2
51.9	51.4	51.2	49.3	50.8	48.0	54.6	50.7	53.5	51.6	52.5	49.7
89.8	85.7	84.3	78.9	87.0	81.6	90.6	86.0	90.0	86.2	92-0	96.6
39.2	37.1	42.9	39.2	45.1	38.0	45.2	42.1	37.2	43.7	43.0	42.0
79.5	73.8	75.9	71.2	77.8	71.6	81.4	77.4	81.3	74.5	81.8	78.4
39.2	51 4	53 4	52.6	54.1	53.2	55.5	54.9	53.2	55.6	55.7	54 3
67.3	64.6	65.1	62.1	66.6	62.4	68.9	66.1	66.7	66.1	66.2	64.9
90.2	89 8	85.6	83.4	87.6	83.1	86.6	88.4	89.5	85.0	91.6	88.3
44.3	46.3	45.1	46.1	44.3	44.0	50.1	48 1	45.7	46.7	33.9	46.5
76.7	80.0	73.7	74.7	72.8	76.0	74.2	81.0	74.8	76.9	75.2	77.4
53.1	57.2	54.3	55.9	54.0	54.4	55.9	55.3	56.1	56.1	50.4	55.2
67.0	68.9	64 3	65.7	65.0	65.2	66.9	68.1	64.8	65.8	65.3	66.6
94.8	89.8	89.6	82.7	90.1	85.6	91.7	85.4	94.8	87.1	94.6	91.3
45.5	40.3	44.1	46.3	41.0	45.0	42.1	45.1	39.7	39.2	38 0	41 1
69.7	77.6	75.8	72.9	74.8	74.2	77.4	74.1	80 4	76.2	81.1	76.9
56.2	52.4	54.7	54.1	53.7	57 1	55.0	53.1	56.0	55.5	57.6	53.0
69.5	66.4	65.6	63.7	66.2	63.8	68.3	64.2	67.7	64.6	67.2	64.8
93.3	82.8	85.2	75.1	88.6	81.1	92.6	78.3	90.3	80.7	93.6	84.6
34.1	29.0	34.9	33.4	36.0	32.0	35.1	29.1	28.7	31.6	30.7	32.2
77.4	66.6	71.5	63.5	71.5	66.1	76.6	66.2	73.2	68,0	72.4	65.3
51.9	42.8	51.6	45.6	51.4	47.7	51.6	44.5	52.0	45 4	47.3	43.3
66.1	56.8	62.2	55.0	61.9	55.0	64.2	55.4	61.7	55.1	61.3	53.7
85.8	79.8	81.5	71.0	77.1	73.6	77.7	79.8	72 6	80.8	72.2	77.0
19.9	25.0	24.3	27.1	22.4	23.9	19.0	25.0	20,3	21.9	22.0	23.4
62.8	55.4	56.8	52 2	57.1	52.2	58.6	56 7	54.9	54.6	56.4	51.7
38.4	38.3	39.7	37.6	35.9	38.2	39.2	33.5	38.7	36.5	35.1	35.6
53.0	47.1	49.0	45.4	49.9	44.4	48.8	47.1	46.2	43.3	44.4	43.5
63.8	68.3	54.1	60.1	55.1	61.1	54.7	58.3	58.1	67.7	52.6	63.4
12.3	9.8	10.7	13.4	14.1	7.0	14.0	10.3	9 0	— 1.0	9.4	4.0
45.8	50.5	40.5	44.6	40.4	43.4	41 0	42.8	39.6	43.9	38.3	41.5
26.8	28.6	27 3	29.7	27 2	28.0	24.7	29.2	24.2	26.5	22.6	25.4
36.7	40.6	34.1	37.9	32.9	35.6	32.5	36.8	31.9	35.2	24.4	32.4
55.8	55.3	50.6	48.7	52 1	48 0	51.7	44 2	55.0	51.6	51.6	47.8
—19.5	— 1.0	—13.3	— 4.6	—27.6	— 9 1	—23.0	—10 0	— 26 8	—25.5	—33.9	—22.0
35.8	36.9	31.7	33.1	29.5	30 6	29 5	31 0	26 7	25 8	21.6	25.6
17 2	22.3	18.8	18.5	13 9	14.5	12.9	14 3	9.5	6.4	9.0	6.2
27 5	28.8	25.9	26.6	21.2	24.2	20.9	25.1	18.2	16.3	14.4	15.6
94.8	89.8	89.6	83.4	90.1	85.6	92.6	88.4	94.8	87.1	94.6	96.6
—23.0	—11.5	—13.3	—19.5	—32.1	—28.1	—23.0	—22.9	—31.3	—25.5	—34.9	—34.0
46 1	44 3	43.8	41.9	42.7	39.5	44.6	41.6	41.9	39.5	39.9	38.1

THE

TABLE No. II.—Monthly Summary of Sunshine at the principal stations in Ontario, horizon in each month, the hours of registered

Month.	Hours of Sun above Horizon.	Windsor.		Woodstock.		Stratford.		St. Catharines.	
		1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
January	285.7	62.9	71.7	43.5	71.1	.....	68.4	44.1	46.0
February	291.4	53.7	96.8	52.1	105.3	46.0	104.7	42.6	52.0
March	369.9	128.0	150.1	157.0	162.2	154.2	164.1	108.9	118.8
April	406.4	167.7	192.6	157.2	160.5	161.7	171.0	114.4	154.3
May	461.1	196.0	198.2	170.7	172.7	140.2	184.7	147.3	191.1
June	465.7	256.6	211.0	265.8	207.7	289.8	226.5	283.6	219.4
July	470.9	247.1	279.0	248.4	227.2	248.1	249.5	257.5	241.5
August	434.5	250.1	297.0	264.0	274.4	183.3	299.9	279.4	262.5
September	376.3	198.7	157.4	211.5	177.4	150.2	181.4	.....	155.6
October	340.2	130.6	117.1	136.2	112.5	92.7	113.6	.....	103.8
November	286.9	83.4	109.2	61.8	89.3	63.0	71.9	49.7	79.4
December	274.3	37.5	60.8	48.0	50.9	59.5	43.1	36.0	34.5
Totals	4463.3	1812.3	1940.9	1816.2	1811.2	.....	1878.8	.....	1658.9

TABLE No. III.—Monthly Summary of the average fall of Rain and

Month.	West and South-West.						North-West		
	Rain.			Snow.			Rain.		
	1884.	1883.	1882.	1884.	1883.	1882.	1884.	1883.	1882.
	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	0.32	0.49	1.44	23.1	16.2	9.5	0.42	0.21	1.08
February	2.02	2.16	1.66	10.6	17.4	4.3	0.49	1.68	0.69
March	1.64	0.18	2.74	6.4	27.4	13.1	1.07	0.17	1.96
April	1.24	1.60	1.56	2.9	2.6	0.7	1.01	1.36	1.62
May	3.11	4.96	4.77	S.	S.	S.	3.72	3.78	2.14
June	2.19	4.96	3.77	.....	.....	.....	1.40	5.67	3.08
July	3.55	5.71	1.50	.....	.....	.....	2.41	4.02	1.65
August	1.94	1.55	4.05	.....	.....	.....	1.42	1.98	2.80
September	2.05	2.70	1.74	.....	.....	.....	3.45	3.32	2.58
October	3.58	2.25	1.86	0.8	.....	.....	3.96	0.06	1.90
November	1.75	3.12	1.19	7.3	6.4	10.4	1.84	2.92	1.25
December	1.67	1.01	0.64	13.1	10.7	23.0	2.75	0.44	0.43
Totals	25.06	30.69	26.92	64.2	80.7	61.0	23.94	25.61	21.18

WEATHER.

during the years 1883 and 1884, showing the number of hours the sun was above the sunshine, and the totals for the year.

Toronto.		Barrie.		Lindsay.		Kingston.		Cornwall.		Pembroke.	
1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
51.1	86.2	35.5	72.4	47.3	82.7	50.3	95.5	56.7	96.3	39.3	.....
52.2	129.7	40.8	75.7	56.9	110.2	52.5	119.6	60.2	107.2	43.0	.....
159.7	191.6	138.9	146.5	177.6	190.9	152.5	191.6	154.2	181.8	153.2	.....
166.0	184.7	146.0	171.5	176.0	214.4	140.6	184.3	146.1	244.7	137.3	.....
209.3	184.0	182.1	168.2	194.2	200.6	173.8	218.8	178.3	210.1	185.9	151.9
320.4	241.5	270.8	205.5	299.4	253.2	239.5	244.7	299.7	230.9	272.3	.....
246.9	275.1	226.2	238.2	247.1	275.5	191.1	263.4	184.6	274.1	166.6	265.8
281.1	305.1	223.7	275.6	272.6	301.6	290.2	267.5	259.1	247.2	248.4	240.0
214.2	193.1	119.7	156.6	208.9	192.3	228.8	190.6	188.7	202.0	145.8	143.8
197.7	127.3	102.6	98.7	137.3	135.1	127.0	123.0	101.1	118.9	25.5	105.9
63.7	90.2	32.8	53.4	70.3	78.0	67.2	90.5	60.2	55.7	41.1	53.3
29.5	30.3	43.8	27.2	58.7	42.2	53.8	68.4	35.9	40.5	42.6	16.7
1931.8	2038.8	1562.9	1689.5	1946.3	2076.7	1767.3	2057.9	1724.8	2099.4	1501.0	.....

Snow in the several districts of Ontario for the years 1882, 1883 and 1884.

and North.			Centre.						East and North-East.					
Snow.			Rain.			Snow.			Rain.			Snow.		
1884.	1883.	1882.	1884.	1883.	1882.	1884.	1883.	1882.	1884.	1883.	1882.	1884.	1883.	1882.
in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
47.5	42.7	20.4	0.24	0.66	1.22	34.5	19.4	7.8	0.35	0.29	0.96	44.6	17.3	20.7
21.5	39.5	11.7	1.92	1.24	1.18	10.8	16.0	5.4	0.94	0.80	0.95	22.1	16.3	10.6
7.6	18.7	16.4	1.63	0.17	1.58	7.5	21.4	4.6	1.17	0.12	1.23	12.7	22.4	12.6
3.0	3.9	1.5	0.77	1.65	0.94	2.3	3.9	0.3	0.68	1.52	1.25	1.7	3.4	2.2
S.	S.	S.	2.53	4.82	3.59	S.	S.	S.	2.40	4.87	2.94	S.	S.	S.
.....	.....	.....	2.12	4.86	3.17	.....	.....	.....	1.16	4.44	3.29	.....	.....	.....
.....	.....	.....	3.61	3.78	1.17	.....	.....	.....	4.21	3.39	2.48	.....	.....	.....
.....	.....	.....	1.62	2.38	3.74	.....	.....	.....	2.42	2.19	3.04	.....	.....	.....
.....	.....	.....	2.81	2.33	1.94	.....	.....	.....	2.35	2.81	3.31	.....	.....	.....
4.0	.....	.....	2.02	1.32	1.30	0.4	.....	.....	2.27	2.06	1.33	0.7	.....	.....
15.9	17.0	16.1	1.55	2.27	1.44	8.3	3.5	8.7	1.72	2.10	1.30	17.7	11.1	4.5
21.8	22.3	40.3	1.49	0.61	1.28	15.3	9.3	17.7	2.12	0.58	0.25	15.1	14.6	23.5
121.3	144.1	106.4	22.31	26.09	22.55	79.1	73.5	44.5	21.79	25.17	22.33	114.6	85.1	74.1

THE

TABLE No. IV.—Summary of the fall of Rain and Snow during each month of days on which

STATIONS.	OBSERVERS.	JANUARY.				FEBRUARY.				MARCH.				APRIL			
		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.	
		Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.
ESSEX—																	
Amherstburg	John Bell	0.36	1	7.3	9	2.76	10	3.0	8	1.29	8	2.1	3	1.17	5	4.0	3
Cottam	W. E. Wagstaff	0.67	2	17.2	11	3.18	10	5.5	8	1.57	5	5.6	7	2.30	7	5.0	2
Maidstone	J. F. Kane	0.23	1	....	..	2.92	10	....	..	1.73	8	....	..	1.84	6	....	..
Windsor	A. Sinclair, M.A.	0.25	1	10.5	7	1.97	6	10.5	6	1.73	8	6.5	2	1.32	5	3.0	2
KENT—																	
Blenheim	W. R. Fellowes	0.41	1	18.0	16	4.55	13	7.0	4	2.74	8	9.0	2	1.92	8	3.0	2
Chatham	W. D. A. Ross	0.25	1	13.1	11	2.75	11	7.0	9	1.48	7	4.2	3	2.17	11	1.6	3
Dealtown	S. J. Pardo	0.39	2	11.9	14	3.21	11	4.5	10	1.82	7	3.5	5	1.87	12	S.	3
Ridgetown	Thos. Scane, P.L.S.	0.50	1	13.2	13	1.99	7	7.7	10	2.19	6	6.0	5	1.69	6	1.5	3
ELGIN—																	
Aylmer	W. H. Draper	0.25	1	23.7	8	1.89	7	11.5	4	2.30	9	15.2	8	1.61	5	0.3	1
Cowel	Samuel MacColl	0.50	2	16.8	10	2.65	8	6.3	3	1.83	6	6.0	5	1.58	4	1.5	2
Lyons	Wm. McCredie	0.26	1	17.4	10	1.97	8	7.0	7	2.01	8	5.0	4	1.77	7	S.	2
Port Stanley	M. Payne	0.30	1	13.7	15	2.34	12	8.1	15	1.95	8	5.4	7	1.12	6	1.8	5
St. Thomas	S. Williams	0.24	1	15.8	10	2.81	12	9.6	10	1.83	7	7.8	5	1.19	5	1.1	4
NORFOLK—																	
Port Dover	H. Morgan	0.60	1	45.6	18	2.56	15	8.4	17	1.95	9	3.9	7	0.65	6	0.6	2
Ranelagh	Prosper Winksell	0.57	1	28.7	14	3.44	5	10.5	6	1.74	6	7.2	6	1.20	6	2.0	2
Simcoe	D. S. Patterson, B.A.	....	..	15.6	8	0.97	5	8.0	5	2.04	6	3.5	3	0.48	4	1.0	1
WELLAND—																	
Thorold	H. Minhinnick	0.12	1	36.5	10	2.46	12	5.0	3	2.75	10	S.	2	0.76	5	....	..
Wel and	R. Grant	0.50	1	42.0	8	1.28	4	9.0	4	2.46	5	5.0	3	0.60	2	2.0	1
LAMBTON—																	
Birnam	J. S. Mellor	0.10	1	22.0	10	2.44	7	21.0	11	1.69	7	9.8	6	1.15	5	2.8	4
Florence	D. H. Bedford	0.34	1	14.5	10	3.06	13	9.9	8	1.65	6	7.5	5	1.60	8	0.8	2
Oil Springs	George Yates	0.11	1	6.0	6	2.17	10	6.2	9	1.79	6	3.5	5	1.60	5	1.3	2
Petrolea	P. McG. Brown	0.27	1	9.5	7	1.48	4	11.3	9	1.43	6	4.0	8	1.49	6	S.	4
Sarnia	W. Mowbray	0.25	2	10.5	8	2.12	6	10.7	7	1.14	8	5.7	5	....	..	....	..
Thedford	Martin Wattson	0.03	1	19.5	6	0.79	4	11.0	8	1.43	7	8.8	5	1.29	6	1.0	1
Watford	D. Ross	0.30	1	....	..	1.97	8	....	..	1.82	5	....	..	1.17	4	....	..
Wilsoncroft	J. L. Wilson	0.04	1	8.0	5	0.95	4	12.8	11	1.57	6	4.5	3	1.50	5	S.	2
HURON—																	
Carlow	J. Varcoe	1.00	1	34.7	14	1.69	4	12.5	5	1.32	6	8.0	3	1.40	3	3.0	3
Egmondville	G. E. Cresswell	0.29	1	50.0	20	0.99	7	21.3	18	1.42	10	10.6	9	1.06	5	5.2	5
Goderich	H. J. Strang, B.A.	0.20	1	17.0	22	0.60	6	8.5	18	1.47	9	4.0	10	1.17	2	3.6	4
Goderich L. House	G. N. Macdonald	0.30	1	38.0	22	0.90	6	18.2	18	1.66	8	10.5	10	1.32	4	4.5	5
Sunshine	George Hood	0.18	2	22.4	11	0.39	3	11.0	9	1.36	4	4.6	3	1.42	4	2.0	1
Zurich	G. Hess	0.03	1	27.0	10	0.92	7	9.8	8	0.98	7	11.0	8	1.05	3	6.0	3
BRUCE—																	
Lion's Head	M. J. Morris	....	..	....	..	....	..	....	..	....	..	....	..	0.87	3	S.	1
Point Clark	D. Small	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..
Saugeen	Mrs. K. Stewart	0.12	1	35.9	25	0.70	4	22.5	17	1.18	7	4.6	6	1.30	7	6.0	3
Teeswater	Robert Clark	1.00	1	10.2	11	1.00	2	10.5	6	2.25	3	2.0	1	0.88	3	3.0	2
Wiarton	Wm. Woodman	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..

WEATHER

of the year 1884, as recorded at the several Stations in Ontario, and the number Rain or Snow fell.

May.				June.		July.		August.		September		October.				November.				December.			
Rain.		Snow.		Rain.		Rain.		Rain.		Rain.		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.	
Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.
3.62	14	....	..	1.40	6	5.94	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3.28	12	....	..	1.89	8	5.75	7	1.46	9	1.61	7	1.94	9	S.	1	0.89	3	6.0	6	2.24	9	10.8	10
2.52	9	....	..	2.21	7	5.42	9	1.14	5	2.13	8	2.00	7	....	..	1.44	6	....	..	1.89	9	11.0	6
1.86	9	....	..	1 79	10	3.53	10	1.62	6	2.67	7	2.09	7	S.	1	1.39	4	4.0	4	1.50	6	13.8	10
3.19	10	....	..	1.48	3	5.43	10	2.90	6	1.97	5	2.66	8	S.	1	1.11	3	3.0	3	3.13	6	8.0	4
2.23	12	....	..	2.14	4	4.98	10	1.65	9	0.83	8	2.91	14	S.	1	1.10	4	4.9	6	2.01	9	7.7	8
3.25	11	....	..	2.39	7	4.34	9	2.86	5	1.63	8	1.69	7	S.	1	0.97	4	2.0	2	1.71	9	13.0	6
2.61	10	....	..	1.50	9	5.94	12	3.46	8	1.43	11	2.80	15	S.	2	1.04	4	3.8	5	1.77	8	12.0	9
4.14	15	....	..	2.78	6	5.04	10	2.60	9	2.47	8	3.78	11	0.5	1	2.31	5	6.6	5	2.36	7	9.5	8
2.37	8	....	..	2.15	6	4.47	8	2.63	5	2.06	6	3.29	7	S.	1	1.84	4	4.3	2	2.30	5	14.0	4
2.73	12	.. .	..	2.14	6	2.99	9	1.84	8	2.41	8	4.96	13	S.	2	2.82	5	9.5	4	1.80	6	12.0	5
2.80	19	....	..	0.95	7	3.56	12	1.60	9	1.59	9	2.53	16	S.	1	1.45	3	6.1	7	1.51	12	11.1	11
3.10	14	....	..	2.91	7	3.54	13	2.51	10	2.10	7	3.98	12	....	..	1.98	5	6.2	6	1.72	9	10.7	8
3.20	18	....	..	1.60	8	3.60	12	1.10	11	1.74	11	2.55	16	0.5	1	1.17	5	5.4	6	1.29	12	16.1	9
2.79	9	....	..	2.73	5	.....	....	2.05	2	1.97	5	3.35	7	0.8	1	1.62	3	7.8	2	1.64	3	6.5	7
2.54	8	....	..	1.05	4	1.26	3	1.53	5	1.58	6	2.60	17	....	..	1.02	4	6.6	4	1.99	8	10.0	10
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2.32	10	....	..	2.05	4	5.25	7	0.99	3	1.43	6	1.19	9	....	..	1.10	3	13.0	4	1.30	2	18.0	7
2.19	14	....	..	1.17	4	2.74	11	1.78	10	2.05	11	3.12	12	S.	1	2.31	5	13.0	6	1.17	4	25.0	9
2.96	14	....	..	1.50	8	5.02	10	1.74	7	2.08	7	2.79	9	....	..	1.15	3	6.0	4	1.48	6	10.8	4
2.62	12	....	..	1.97	10	3.28	11	1.66	8	1 74	10	5.33	10	S.	2	1.65	4	5.2	2	1.45	5	13.5	8
2.51	10	....	..	1.39	6	2.12	9	1.26	8	2.08	8	3.74	11	S.	2	1.62	3	5.5	3	0.63	3	10.0	4
2.18	11	....	..	2.15	7	2.16	9	1.61	6	1.85	6	4.17	12	....	..	2.08	7	0.3	3	1.12	6	18.5	7
2.67	15	....	..	1.87	7	2.50	10	1.32	9	2.04	10	4.58	13	S.	1	2.58	5	7.3	6	1.30	8	17.0	8
1.70	9	....	..	2.69	7	3.41	8	1.81	8	2.38	8	3.81	11	....	..	2.20	4	....	..	1.80	2	.....	..
2.45	14	....	..	2.99	9	3.58	12	1.49	7	.....	....	.....	.....	.....	.....	1.16	4	5.0	2	1.92	8	19.0	10
5.22	13	....	..	0.90	2	0.74	4	0.72	3	4.59	7	1.64	7	6.0	2	3.30	3	19.0	6	6.13	6	17.5	4
3.75	18	....	..	1.51	6	1.58	12	0.99	13	2.87	12	2.79	16	1.9	3	2.09	8	4.5	3	2.45	7	12.6	6
4.94	17	....	..	0.80	7	1.50	14	0.70	11	3.30	16	4.18	15	7.0	2	0.93	7	5.3	12	2.92	8	15.0	13
4.00	17	....	..	0.81	5	1.39	12	0.80	8	3.00	16	4.55	19	3.0	2	1.75	7	16.7	11	2.62	9	31.3	17
3.67	13	....	..	1.82	6	1.86	7	0.84	7	4.02	10	4.27	9	3.5	2	1.92	6	5.8	5	3.58	7	23.5	8
3.75	15	....	..	2.89	6	2.01	10	0.73	5	3.58	11	4.28	13	2.5	2	2.20	2	10.8	5	1.91	9	22.5	8
3.34	11	....	..	1.05	4	1.85	7	.....	....	3.17	7	5.54	9	6.0	2	2.47	3	9.0	6	3.37	5	9.0	..
.....	.....	.....	.....	.....	.....	.....	.....	0.91	7	2.73	8	3.38	7	S.	1	2.42	4	6.0	2	2.52	6	25.0	7
3.14	16	....	..	1.25	5	1.50	10	1.78	10	2.33	14	4.05	11	7.5	2	1.38	8	15.2	10	1.93	6	43.0	14
4.47	5	....	..	0.35	1	0.62	2	1.12	3	2.97	4	....	..	....	..	0.45	1	12.8	5	2.03	3	10.0	4
4.17	8	....	..	0.53	2	2.21	6	0.84	3	2.83	6	5.52	11	7.0	3	0.27	5	7.0	7	3.15	5	33.5	10

THE

TABLE No. IV.—Summary of the fall of Rain and

STATIONS.	OBSERVERS.	JANUARY.				FEBRUARY.				MARCH.				APRIL.			
		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.	
		Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.
GREY—																	
Bognor	C. H. Henning	R.	1	40.0	14	....	..	33.0	13	1.35	3	6.5	4	0.88	3	4.3	4
Durham	Dr. Gunn	0.30	1	84.0	19	0.60	4	25.0	12	1.50	6	4.0	5	0.89	3	4.0	4
Egremont	G. J. McCulloch	0.30	2	15.2	10	0.34	5	19.7	15	1.38	6	6.3	7	0.80	3	3.0	5
Owen Sound	John McLean	0.13	1	67.0	23	R.	1	25.0	11	0.81	5	4.0	4	1.02	3	1.0	1
Presqu' Isle	John McKenzie	1.35	2	55.0	23	1.10	4	27.0	8	2.00	3	9.0	4	1.70	5	1.0	1
SIMCOE—																	
Barrie	H. B. Spotton, M.A.	0.10	1	37.4	15	....	..	10.2	15	0.67	4	3.3	8	0.58	4	3.0	5
Coldwater	J. N. Lazonby	1.05	1	76.0	17	0.50	1	11.8	7	0.84	3	6.0	4	3.96	5	3.5	2
Glencairn	H. W. Stephens	0.03	1	27.0	12	0.03	2	17.5	14	0.61	3	4.5	7	0.69	4	2.0	2
Orillia	H. W. Fitton	R.	2	57.2	18	R.	5	21.5	22	0.77	7	8.5	8	0.44	4	8.0	5
Penetanguishene	Rev. J F. McBride	....	..	69.5	14	....	..	24.0	8	0.62	3	6.0	2	0.86	9	8.0	2
MIDDLESEX—																	
Ailsa Craig	John Rennie	0.48	1	26.0	16	1.18	2	5.0	2	1.48	3	6.0	4	0.89	3	3.0	1
Delaware	A. Francis, M.D.	0.14	1	17.5	10	2.42	13	10.5	8	1.84	8	6.0	5	1.36	7	....	..
Granton	James Grant	R.	1	15.0	16	0.53	6	10.0	16	1.61	7	18.0	8	0.54	3	7.2	5
London	E. B. Reed	0.83	2	39.0	14	3.14	11	11.3	13	1.38	8	13.8	7	0.96	6	6.7	3
Lucan	Wm. Stanley	....	..	....	..	0.55	4	9.0	9	0.63	7	9.3	7	1.39	..	1.5	..
Putnam	Wm. Uglow	0.19	2	16.5	13	2.14	7	10.6	10	2.25	7	6.0	6	0.89	4	1.9	5
Strathroy	J. S. Challoner	0.22	1	28.0	10	2.00	12	16.0	11	1.38	7	6.9	6	1.01	4	4.2	5
Wilton Grove	Hy. Anderson	0.20	1	5.0	16	1.73	5	16.0	7	1.71	5	6.0	3	0.93	3	4.0	2
OXFORD—																	
Otterville	Thos. Wright	0.25	1	22.7	8	2.63	9	8.3	6	1.58	4	4.2	3	1.33	6	2.4	2
Princeton	David Beamer	0.58	2	30.0	9	2.61	10	14.2	10	2.11	7	7.0	4	1.33	7	7.5	8
Woodstock	N. Wolverton, B.A.	0.27	2	49.8	12	0.05	4	16.8	11	0.95	7	4.2	5	0.64	3	4.0	3
BRANT—																	
Brantford	T. M. McIntyre, M.A.	0.21	1	36.0	6	1.39	3	8.0	4	1.33	5	6.0	2	0.14	3	....	..
Paris	John Kay	....	..	....	..	....	..	....	..	....	..	....	..	0.98	8	5.4	4
St. George	Dr. Kitchen	....	..	26.0	7	2.14	6	19.0	11	1.88	8	10.5	4	0.74	4	4.5	4
PERTH—																	
Kirkton	Henry Doupe	0.25	1	30.3	16	2.10	7	15.5	14	1.81	6	5.6	6	1.54	6	1.6	3
Listowel	Alex. McKay	0.21	1	27.1	17	1.58	8	21.5	15	1.25	6	12.5	8	0.86	8	2.0	5
Stratford	Wm. McBride, M.A.	R.	1	40.0	12	2.47	6	17.7	10	2.11	6	9.9	5	0.70	3	5.2	5
WELLINGTON—																	
Drayton	W. Fitzgerald	0.22	1	26.0	12	0.56	5	12.0	8	0.63	5	5.5	3	0.71	3	0.5	2
Fergus	A. D. Ferrier	0.89	1	51.4	16	1.51	5	17.3	21	1.31	11	11.2	8	0.81	4	6.2	4
Guelph	E. A. Wark	0.13	1	34.5	11	1.25	3	7.0	7	0.77	4	4.0	3	0.25	2	1.5	3
WATERLOO—																	
Conestogo	G. A. McIntyre	0.25	1	38.5	15	1.68	8	17.8	23	1.70	9	16.5	11	0.81	9	7.0	5
DUFFERIN—																	
Orangeville	N. Gordon	0.50	1	....	..	0.35	4	13.5	13	1.86	7	12.5	3	0.57	4	3.0	2
LINCOLN—																	
St. Catharines	R. Cameron	0.17	3	37.5	14	2.69	12	7.5	6	2.10	10	6.0	4	0.53	5	....	..
WENTWORTH—																	
Copetown	John Ireland	0.37	1	46.0	15	3.32	8	15.7	13	1.83	7	10.1	5	1.24	8	0.5	3

WEATHER.

Snow during each month of the year 1884.—*Continued.*

May.				June.		July.		August.		September		October.				November.				December.			
Rain.		Snow.		Rain.		Rain.		Rain.		Rain.		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.	
Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.
5.15	12	S.	2	1.54	6	2.00	8	2.78	4	3.95	9	6.31	15	9.0	5	1.94	7	33.0	7	3.58	8	42.0	11
3.80	14	1.0	1	1.70	4	3.42	11	1.05	8	3.32	12	2.71	5	3.0	1	1.94	6	14.0	9	3.26	8	45.0	8
4.37	17	1.5	2	0.68	5	2.16	12	1.21	11	5.08	14	3.39	10	5.3	4	2.23	6	14.0	9	2.49	7	11.0	7
4.96	12	S.	2	1.07	4	2.91	9	1.12	7	2.09	8	4.41	11	6.0	1	1.94	5	14.0	3	2.79	5	50.0	12
4.05	11	0.3	2	0.90	2	2.38	11	0.56	6	1.98	9	4.90	13	10.0	3	2.55	4	10.6	6	3.20	7	38.0	17
2.84	10	1.0	1	1.28	5	2.19	7	0.58	6	3.00	10	1.84	10	1.5	2	1.55	8	4.0	10	2.30	5	26.0	13
3.43	7	....	..	1.40	4	3.21	7	1.50	6	3.73	9	4.96	16	9.3	3	1.93	5	32.3	6	3.10	4	25.5	11
3.55	12	0.5	2	2.65	5	2.14	10	0.94	9	2.42	11	2.59	9	6.0	2	0.90	4	15.0	6	1.15	8	12.8	7
2.59	14	0.5	1	3.37	6	1.71	12	1.12	12	2.11	13	2.40	14	3.8	3	1.26	10	25.2	10	1.91	6	28.2	13
2.98	8	....	..	1.02	4	2.51	7	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....
2.08	11	....	..	1.15	4	2.63	8	1.43	8	3.10	10	5.11	8	1.0	1	2.14	3	14.0	4	1.47	4	12.0	2
1.90	12	....	..	3.86	9	3.22	10	1.82	9	2.68	10	4.62	14	.....	....	2.28	6	4.5	3	1.69	11	12.0	5
2.87	15	....	..	1.59	8	4.75	11	1.69	9	4.70	17	4.00	14	4.0	3	1.68	4	7.0	9	1.38	5	24.0	12
3.06	14	....	..	1.27	6	4.45	9	2.10	9	2.41	8	4.45	10	4.0	1	2.32	4	27.7	5	2.74	1	25.0	6
2.54	..	....	..	1.11	5	3.41	7	1.26	4	3.42	6	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....
3.21	15	....	..	1.96	9	4.39	8	1.97	7	2.23	8	4.20	12	1.2	2	1.13	3	7.2	6	2.58	7	12.5	8
2.09	11	....	..	2.78	8	.....	....	1.61	9	1.89	6	5.20	13	1.0	1	2.04	3	8.0	6	1.85	9	18.0	10
3.69	9	....	..	2.65	4	4.20	9	0.67	3	2.25	7	5.09	11	S.	2	2.68	2	5.0	3	0.75	2	10.0	4
3.85	13	....	..	3.11	5	3.02	10	3.08	5	2.33	6	4.63	11	S.	2	1.98	5	11.0	4	1.12	5	11.2	4
2.86	15	....	..	2.53	4	6.11	10	1.58	7	2.64	9	3.50	14	S.	1	2.05	3	5.5	3	2.42	8	11.0	8
3.86	17	....	..	4.25	7	4.18	10	1.29	8	3.02	12	5.00	11	2.5	2	2.19	4	11.8	3	1.90	5	20.0	9
2.47	11	....	..	2.73	5	.....	....	1.94	4	1.58	6	2.34	10	S.	1	1.79	5	7.0	1	0.08	1	10.5	3
3.06	17	....	..	2.67	8	3.59	12	2.49	7	2.42	10	2.67	14	0.3	2	2.25	7	7.3	5	0.94	3	10.0	7
3.50	17	....	..	1.59	7	1.87	12	2.82	7	2.64	8	1.97	10	1.2	1	2.12	6	5.0	2	1.02	6	13.5	9
3.11	14	....	..	2.25	8	3.31	13	1.97	11	5.12	12	3.12	13	1.8	2	2.34	8	13.8	8	2.69	8	28.0	12
5.69	19	S.	1	1.73	9	2.13	12	1.69	8	4.03	12	3.28	11	7.0	2	2.21	5	10.5	7	2.24	7	25.1	11
3.26	11	....	..	1.69	7	2.77	10	2.79	10	4.38	8	4.74	10	3.2	2	2.60	3	17.5	6	4.04	6	20.4	12
3.30	12	....	..	1.00	....	2.35	6	1.81	7	3.45	7	4.02	12	1.0	2	1.70	3	3.5	6	1.00	4	11.0	6
3.53	20	S.	2	1.49	9	4.47	13	2.69	12	4.40	15	2.40	18	1.4	1	2.44	9	7.7	9	1.39	10	17.3	12
1.74	8	....	..	2.05	5	1.93	7	1.77	5	2.07	9	3.04	14	1.5	2	0.94	3	3.0	3	0.27	2	6.0	6
5.27	19	....	..	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	1.65	5	20.9	15
2.97	13	1.6	1	1.72	7	2.23	9	1.89	12	4.41	12	2.44	10	S.	3	2.24	6	3.0	4	1.82	5	18.5	8
2.67	13	....	..	1.58	6	4.20	10	2.06	6	1.31	6	1.75	8	S.	1	1.37	4	4.0	2	1.43	6	12.3	9
2.94	13	....	..	2.17	9	3.26	9	1.73	5	2.06	8	1.86	11	S.	2	1.51	4	6.5	4	.....	....	.....	....

THE

TABLE No. IV.—Summary of the fall of Rain and

STATIONS.	OBSERVERS.	JANUARY.				FEBRUARY.				MARCH.				APRIL.			
		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.	
		Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.
WENTWORTH—*Con.*																	
Glanford, N.	E. Dickenson	0.10	1	29.0	8	1.00	6	12.0	5	0.84	3	6.0	3	0.67	5	3.0	2
Hamilton	G. Dickson, B.A.	0.34	2	36.5	10	2.24	9	9.0	9	1.66	6	13.0	5	0.93	5	2.0	2
Stoney Creek	C. F. Van Wagner	0.12	2	34.5	12	3.45	12	5.0	6	1.89	6	10.5	4	1.67	6	S.	1
HALTON—																	
Georgetown	J. Barber, jr.	0.32	1	32.4	22	1.56	10	16.4	22	1.45	8	12.9	9	0.82	9	4.7	4
Oakville	F. Cottle	0.08	1	30.4	6	0.94	4	7.0	4	0.84	4	5.0	1	0.75	5	....	..
PEEL—																	
Coventry	John Caldwell	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..
Credit	W. B. Dixie, M. D.	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..
YORK—																	
Aurora	J. E. Armstrong	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..
Georgina	Capt. Sibbald	0.30	1	47.1	21	0.88	3	24.1	20	0.63	7	6.6	9	0.33	5	3.6	2
Scarborough	R. Martin	0.17	1	32.0	20	2.65	7	8.7	18	1.64	8	6.7	8	0.85	6	....	..
Toronto	Observatory	0.16	2	31.4	19	1.16	10	16.5	16	1.47	8	10.6	10	0.69	8	2.7	4
ONTARIO—																	
Brechin	P. M. Rae	0.28	1	36.1	7	2.96	8	17.2	10	1.65	6	8.5	5	0.83	4	3.0	2
Cannington	R. C. Brandon	0.30	1	21.3	6	0.12	1	20.0	10	....	..	....	..	0.25	3	3.0	1
Oshawa	Rev. J. Middleton	0.25	1	30.0	13	2.96	8	20.0	11	1.65	6	9.9	5	0.83	6	3.0	3
DURHAM—																	
Port Hope	John Foott	0.45	1	44.0	9	2.35	7	14.0	6	1.71	4	8.5	5	0.53	3	1.0	3
NORTHUMBERLAND—																	
Hastings	C. O'Gorman, M. D.	2.01	1	77.0	8	1.40	4	16.3	12	3.29	5	12.7	7	0.71	5	4.0	2
LENNOX & ADDINGTON																	
Denbigh	James Lane	0.25	1	31.8	9	0.32	3	33.7	18	1.16	3	15.1	6	0.38	3	2.8	2
Glastonbury	E. H. Ruttan	0.53	1	42.0	8	1.42	6	18.5	7	0.95	5	5.0	3	1.04	3	0.5	2
Harrowsmith	John Donnelly	0.92	1	43.0	9	2.15	7	12.0	10	1.76	5	8.0	6	0.86	3	....	..
FRONTENAC—																	
Kingston	A. P. Knight, M.A.	0.20	1	52.7	18	0.81	6	19.0	18	1.27	5	16.3	11	0.66	7	3.1	5
LEEDS & GRENVILLE—																	
Merrickville	J. Burchill, P.L.S.	0.19	1	26.5	7	1.66	6	17.3	14	1.21	6	10.5	4	0.74	5	1.0	1
Prescott	C. Chapman	0.03	1	59.0	16	0.16	5	34.3	16	0.93	7	19.7	9	0.67	3	3.5	4
STORMONT—																	
Cornwall	James Smith, M. A.	0.29	3	33.0	20	1.98	8	21.2	19	1.55	7	16.1	13	0.84	8	2.4	7
PRESCOTT—																	
L'Orignal	J. W. Hay	0.05	1	66.5	19	0.61	4	40.0	11	1.02	8	15.5	7	0.90	8	2.0	1
CARLETON—																	
Ottawa	A. McGill, M. A.	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..
RENFREW—																	
Arnprior	R. Shaw	0.30	1	39.0	11	0.70	2	17.0	9	0.03	1	12.0	6	....	..	....	..
Clontarf	A. Schultz	0.05	1	42.0	15	0.10	1	22.3	14	....	..	....	..	....	..	....	..
Northcote	F. Kosmark	0.02	1	45.0	8	0.68	3	18.0	9	0.28	1	11.5	4	0.49	3	....	..

WEATHER.

Snow during each month of the year 1884.—*Continued.*

May.				June.		July.		August.		September		October.				November.				December.			
Rain.		Snow.		Rain.		Rain.		Rain.		Rain.		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.	
Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.
2.06	8	....	..	2.28	6	4.51	9	1.40	4	1.50	6	1.53	7	....	..	1.48	3	4.0	1	0.65	1	12.0	3
2.37	11	....	..	2.33	6	3.68	7	0.26	6	2.12	10	2.46	13	S.	1	1.89	3	8.0	5	1.17	2	25.0	8
2.56	14	....	..	1.45	4	1.97	12	0.26	6	2.12	10	2.46	13	S.	1	1.62	6	4.0	4	1.11	6	16.0	8
2.99	19	S.	2	1.74	11	3.12	11	1.64	10	3.11	16	2.64	16	2.2	2	1.97	6	5.0	10	2.37	9	15.1	15
....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..
1.64	9	....	..	1.80	5	3.94	6	0.90	2	3.89	7	....	..	....	..	....	..	....	..	....	..	....	..
....	..	....	..	....	..	....	..	2.15	6	4.87	10	2.01	8	....	..	1.72	2	4.0	..	....	..	....	..
2.16	11	S.	1	3.32	6	3.43	9	1.94	7	5.22	10	1.84	7	S.	2	1.82	7	....	..	1.10	4	9.0	5
2.26	12	....	..	1.63	7	2.87	16	1.92	8	3.34	13	1.74	16	1.1	2	1.41	10	1.6	11	1.95	7	24.9	16
1.97	10	....	..	2.64	6	2.79	8	2.04	9	2.49	10	1.39	10	S.	1	1.95	4	5.2	3	2.19	5	5.8	4
2.25	16	....	..	2.21	8	2.12	15	2.12	12	3.19	16	1.42	14	0.8	1	1.79	5	5.2	7	1.97	8	12.9	11
....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..	....	..
1.96	5	....	..	0.10	3	3.55	8	1.61	3	3.69	9	1.87	6	1.0	1	....	..	....	..	0.70	1	3.0	1
2.44	14	....	..	2.00	6	3.60	10	2.77	7	3.54	14	1.63	11	....	..	2.73	5	4.0	2	1.65	2	10.0	6
2.03	8	....	..	1.00	4	4.20	8	2.66	6	3.28	10	2.10	10	S.	2	1.59	5	5.0	2	1.82	3	17.0	5
3.55	13	....	..	0.59	5	6.80	12	2.82	7	2.40	14	2.20	10	1.5	1	1.80	3	12.5	5	2.40	4	19.5	6
2.25	11	....	..	1.25	3	3.34	7	2.64	6	1.53	4	2.17	7	1.0	1	1.53	2	11.5	4	0.80	1	17.5	5
1.81	13	....	..	0.10	2	3.90	7	3.49	7	2.53	7	2.40	9	....	..	2.66	4	7.5	2	3.28	4	8.3	4
1.96	12	....	..	0.97	6	4.10	9	3.31	6	2.53	8	1.48	9	....	..	1.87	3	5.0	3	3.05	4	19.0	5
2.69	18	....	..	0.86	9	4.24	13	3.81	7	2.74	9	1.49	17	0.1	1	....	..	....	..	....	..	....	..
1.57	10	....	..	0.64	4	4.90	11	2.70	6	2.62	8	2.32	13	0.8	1	....	..	....	..	....	..	....	..
1.96	12	....	..	0.75	3	4.91	15	1.64	9	4.08	10	2.65	14	S.	2	....	..	....	..	....	..	....	..
2.20	7	....	..	1.73	5	4.06	17	1.92	8	3 33	12	2.62	19	S.	4	1.79	11	6.9	12	1.59	0	23.3	15
1.19	15	....	..	2.16	6	5.79	14	1.16	4	4.98	10	2.29	10	....	..	0.67	2	30.0	3	3.08	2	4.0	3
....	..	....	..	....	..	....	..	2.82	9	3.75	17	2.73	16	S.	2	1.16	7	7.5	5	2.70	5	16.0	8
2.04	18	....	..	1.08	6	2.69	15	1.33	12	2.79	12	2.61	10	1.0	3	0.75	4	7.0	3	0.91	4	11.0	6
2.04	13	....	..	1.37	5	2.98	12	1.18	8	2.46	9	2.10	9	1.0	1	0.49	3	9.5	4	....	..	....	..

THE

TABLE No. IV.—Summary of the fall of Rain and

STATIONS.	OBSERVERS.	JANUARY.				FEBRUARY.				MARCH.				APRIL.			
		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.	
		Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.
RENFREW—*Continued.*																	
Pembroke	E. Odlum, B.A.	R.	1	32.8	9	0.00	0	24.1	15	0.19	2	2.5	3	0.89	2	S.	2
Renfrew	W. E. Smallfield																
Rockliffe	W. H. McIntyre	R.	1	31.5	14	0.82	4	27.8	13	0.75	2	11.9	7	0.87	6	0.4	5
LANARK—																	
Oliver's Ferry	A. E. Hume	0.15	1	61.3	16	1.27	7	11.8	11	1.61	5	12.5	6	0.67	3	0.8	1
VICTORIA—																	
Bobcaygeon	John Stewart	0.32	1	36.5	9	2.16	4	23.0	12	1.11	4	11.0	6	0.64	4	2.0	1
Kirkfield	John McTaggart	0.55	1	50.0	12	1.30	3	28.8	11					0.75	5	3.0	1
Lindsay	Thos. Beall	0.70	1	69.2	15	0.47	2	20.8	10	0.99	8	11.3	7	0.51	8	3.2	2
PETERBOROUGH—																	
Burleigh	W. McIllmough	0.04	1	55.5	12	0.06	2	25.0	6	0.86	3	10.0	4	0.50	1		
Ennismore	Thos. Telford	0.35	1	34.2	12	1 58	5	19.9	14	1.43	7	9.1	5	0.50	4	1.4	4
Lakefield	S. Sheldrake	R.	1	57.0	11	R.	2	17.8	13	0.89	2	13.5	7	0.52	4	1.0	3
Norwood	Rev. W. Carmichael																
Peterborough	Wm. Tassie, M.A.	0.16	1	27.1	11	1.05	5	21.7	14	1.29	5	14.7	8	0.41	7	0.4	3
HALIBURTON—																	
Haliburton	C. R. Stewart	0.25	1	37.2	15	0.20	1	19.8	12	0.87	4	4.5	5	0.30	4	2.3	4
HASTINGS—																	
Bancroft	J. Cleak	0.23	2	50.0	11	0.93	2	32.9	17	0.71	3	8.0	7	0.79	4	0.9	3
Belleville	John Johnston	0.80	1	60.0	6	0.60	1	10.5	5	0.51	4	16.0	3	0.16	3	0.0	0
Deseronto	Messrs. Rathbun	R.	1	57.3	17	1.00	2	28.8	14	1.60	4	18.0	9	1.70	6	2.0	2
L'Amable	Benj. Spurr	0.23	1	41.0	12	0.56	3	28.5	12	1.10	5	10.5	7	0.53	3	2.5	2
Shannonvile	Rev. Thos. G. Porter	0.32	3	57.6	14	2.04	7	13.2	8	1.33	5	15.7	6				
Stirling	B. F. Butler	0.50	1	44.0	11	1.68	7	11.0	8	1.67	8	16.0	5	0.72	5	1.0	3
Trenton	W. G. Clarke	0.14	1	42.0	14	0.39	2	4.0	5	0.66	5	14.4	4	1.22	7	2.0	1
MUSKOKA—																	
Bala	E. B. Sutton	0.00	0	40.5	18	0.00	0	19.5	18	0.74	4	7.0	9	1.60	4	0.7	4
Beatrice	John Hollingworth	1.05	1	65.3	17	0.25	1	33.0	14	1.39	3	15.5	5	0.71	5	1.0	1
Bracebridge	W. Simmons	0.40	1	26.4	9	0.00	0	37.7	14	1.14	4	4.4	2	0.33	5	2.6	2
Gravenhurst	T. M. Robinson	0.24	1	45.7	20	0.69	5	18.3	13	1.14	5	7.7	8	0.55	4	2.5	2
Hillside	M. McAllister	0.00	0	33.0	12	0.00	0	21.0	14	0.93	2	6.0	2	0.57	5	S.	2
Hoodstown	C. J. Tisdall	0.52	2	48.2	21	0.76	3	19.7	17	1.03	4	9.5	7	0.72	5	0.7	5
PARRY SOUND—																	
Beggsboro'	A. McKenzie																
Parry Sound	Rev. R. Moseley	0.36	1	36.3	23	0.35	4	17.1	17	0.89	5	7.1	9	0.75	6	S.	3
NIPISSING—																	
Sturgeon Falls	Mrs. R. Lillie	0.20	1	9.3	8	0.03	1	10.5	5	0.46	3	2.6	3	0.43	5	S.	1
ALGOMA—																	
Michael's Bay	R. McGee																
Port Arthur	Wm. Cooke			8.9	7			10.8	8			19.0	5	1.42	6	S.	2

WEATHER.

Snow during each month of the year 1884—*Concluded.*

May.				June.		July.		August.		September.		October.				November.				December.			
Rain.		Snow.		Rain.		Rain.		Rain.		Rain.		Rain.		Snow.		Rain.		Snow.		Rain.		Snow.	
Depth inches.	No. of days.	Depth inches.	No. of days	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.	Depth inches.	No. of days.
2.93	13	.....	..	2 18	6	3.29	11	0.97	8	1.91	13	3.48	11	S.	2	1.77	6	12.0	5	3.40	7	27.0	11
1.84	13	.....	..	0.77	5	3.11	14	1.65	8	2.16	10	1.51	8	S.	1	0.75	4	7.0	3	0.91	4	11.0	6
3.04	14	1.0	1	1.75	4	3.87	16	2.88	9	2.87	22	3.40	17	0.5	2	0.16	5	20.5	15	2.19	6	21.1	12
1.88	11	.....	..	1.28	4	5.61	10	4.09	6	2.16	9	1.53	8	....	..	2.23	3	2.0	3	2.89	4	11.3	4
2.29	11	S.	1	1.28	5	4.37	10	2.24	7	3.15	10	2.48	13	S.	1	1.34	8	9.0	3	2.34	6	10.5	9
2.55	16	0.2	1	2.11	7	3.31	12	2.83	9	3.87	13	1.92	10	1.0	3	1.12	6	7.4	7	1.63	7	15.6	11
2.75	8	....	..	0.60	3	3.50	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2.73	12	S.	1	1.84	6	2.80	11	2.80	6	3.17	12	2.08	11	1.8	2	1.24	4	.....	.....	.....	.....	9.0	3
2.71	11	....	..	1.21	5	3.18	12	2.92	7	2.16	12	1.34	11	1.0	1	2.07	7	10.0	6	2.33	5	14.3	11
2.18	10	....	..	0.70	3	5.32	8	.....	.....	3.06	9	1.83	9	2.1	1	0.98	5	6.7	4	2.15	5	15.5	6
2.56	11	....	..	3.31	6	4.26	10	3.43	8	2.82	11	2.00	12	0.3	1	1.82	11	4.2	5	2.31	6	15.8	9
2.55	9	2.0	1	1.30	5	3.36	11	1.65	7	2.73	10	3.82	13	1.0	2	0.84	6	13.7	12	2.29	6	14.4	9
2.65	17	2.3	1	0.72	5	2.94	....	1.61	9	2.56	13	2.58	12	4.7	5	1.74	6	17.2	2	2.14	5	12.4	9
2.65	9	....	..	0.14	3	3.84	6	3.45	7	3.50	10	2.43	7	....	..	.....	.....	.....	.....	2.87	4	9.5	7
3.78	16	.....	..	0.64	7	4.80	13	3.21	7	1.99	9	1.45	12	S.	1	2.04	8	4.5	5	1.36	4	12.5	4
2.95	14	S.	1	0.81	4	3.95	13	1.57	8	3.43	10	2.72	12	2.0	1	1.01	5	15.0	8	2.07	7	10.0	11
1.08	6	....	..	.....	.....	3.46	8	2.57	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2.83	15	....	..	0.87	7	4.90	6	2.85	8	2.57	10	1.72	8	S.	1	2.59	4	3.5	4	2.30	2	12 0	9
2.62	16	....	..	0.86	4	.....	.....	3.21	8	2.58	8	....	..	.....	..	2.15	6	3.5	4	2.26	6	14.6	7
4.31	17	.....	..	1.31	6	2.57	14	1.59	12	2.62	16	4.24	18	4.0	2	2.18	8	30.5	14	3.05	7	34.5	14
5.25	15	.....	..	0.84	4	2.21	15	2.49	12	2.90	9	4.97	15	6.0	2	1.35	5	46.5	9	2.90	6	49.0	11
3.25	12	....	..	1.17	5	2.82	9	0.78	7	2.66	10	3.54	12	3.8	2	1.30	4	13.5	5	2.97	6	12.0	3
3.32	13	.....	..	1.19	5	3.77	11	0.85	8	2.83	14	4.25	15	3.5	2	1.29	5	23.2	10	3.18	7	18.0	11
4.16	13	....	..	1.05	2	2.14	10	1.87	8	2.72	12	4.43	13	1.0	3	1.03	3	22.0	9	2.33	6	25.0	10
4.80	15	....	..	1.18	4	2.40	12	1.90	11	3.37	14	3.61	17	1.9	3	1.71	7	35.1	9	3.11	7	26.4	12
.....	.....	.....	.....	1.72	6	2.63	11	1.78	11	3.06	11	4.07	15	2.5	3	1.63	3	28.0	6	2.64	5	34.5	11
4.65	15	....	..	1.13	3	2.61	12	1.25	10	2.96	12	5.49	14	0.2	1	1.28	6	16.6	8	3.04	7	15.7	14
2.32	4	....	..	1.54	3	.....	.....	1.90	5	5.11	9	3.66	8	0.2	2	3.11	2	5.7	6	4.18	5	9.2	7
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.42	2	10.1	8	1.59	4	4.4	7
2.47	10	....	..	1.07	3	1.92	8	4.23	11	4.41	16	3.76	4	5.9	6	....	..	7.3	4	....	..	12.9	8

THE WEATHER.

TABLE No. V.—Summary of the total fall of Rain and Snow, and the number of days on which Rain and Snow fell in Ontario during the years 1883 and 1884, at Stations reporting for the whole year, and the averages for the Province.

STATION.	OBSERVER.	RAIN.				SNOW.			
		1884.		1883.		1884.		1883.	
		Depth Ins.	No. of Days.	Depth Ins.	No. of Days.	Depth Ins.	No. of Days.	Depth Ins.	No. of Days.
Windsor	A. Sinclair, M.A.	21.79	79	25.20	88	48.3	32	42.0	24
Cottam	W. E. Wagstaff.	26.78	88	28.83	96	54.6	42	35.8	29
Maidstone	J. F. Kane	25.47	85	29.82	89	.....	.....	.....	.....
Dealtown	S. J. Pardo	26.13	92	.....	.....	34.9	41	.....	.....
St. Thomas	S. Williams.	27.91	102	31.20	108	51.2	43	68.1	41
Port Stanley	M. Payne	22.40	114	30.57	123	46.2	61	56.0	69
Port Dover	H. Morgan	17.06	70	31.02	130	44.7	31	78.7	72
Simcoe	D. S. Patterson, B.A.	17.06	70	28.65	77	44.7	31	63.4	23
Birnam	J. S. Mellor	21.91	91	31.72	117	93.6	47	64.4	34
Goderich, Light House.	G. N. Macdonald	23.10	112	27.02	127	122.2	85	117.9	94
Goderich	H. J. Strang, B.A	22.71	114	25.15	109	60.4	79	79.5	73
Zurich	G. Hess	24.33	89	30.36	96	89.6	44	79.5	45
Carlow	John Varcoe	28.66	59	28.10	73	100.7	37	86.1	31
Egmondville	G. E. Cresswell	33.38	120	21.39	115	106.1	64	190.6	80
Saugeen	Mrs. K. Stewart	20.66	99	26.03	104	134.7	77	119.4	77
Presqu'Isle	J. McKenzie	26.67	77	33.56	98	150.3	64	144.0	57
Owen Sound	J. McLean	23.25	71	36.00	73	167.0	57	145.0	51
Egremont	G. J. McCulloch	24.43	98	33.77	93	148.8	62	124.8	76
Orillia	H. A. Fitton	17.68	105	24.79	112	152.9	80	143.2	89
Barrie	H. B. Spotton	16.93	70	22.70	83	86.5	69	84.7	63
Granton	James Grant	25.34	100	36.24	115	85.2	69	103.0	61
Strathroy	T. S. Challoner	25.78	94	29.83	105	82.1	49	96 0	50
Wilton Grove	H. Anderson	26.56	61	35.63	81	46.4	37	62.8	32
Delaware	A. Francis, M.D	27.83	108	33.69	108	50.5	31	66.0	41
Ailsa Craig	John Rennie	23.14	65	34.93	79	67.0	30	86.5	30
Otterville	Thomas Wright	28.91	80	27.82	86	59.8	29	75.6	35
Woodstock	Prof. Wolverton, B.A.	27.60	90	28.15	97	109.1	45	125.7	54
Stratford	Wm. McBride, M.A.	33.55	81	33.51	112	113.9	52	119.9	64
Listowel	Alex. McKay	26.90	106	39.27	111	105.7	66	118.2	74
Guelph	A. E. Wark	16.21	63	28.26	60	57.5	35	60.0	30
Fergus	A. D Ferrier	27.33	127	33.35	122	112.5	74	100.7	74
Copetown	John Ireland	23.83	87	27.95	87	86.7	49	75.5	40
Hamilton	G. Dickson, B.A.	23.85	81	21.67	80	94.0	41	82.8	35
North Glanford	E. Dickenson	18.02	59	22.25	62	66.0	22	61.0	.....
Toronto	Observatory	20.53	123	25.73	124	80.2	69	84.0	74
Georgina	Capt. Sibbald, R.N.	19.26	105	27.86	115	109.0	81	79.2	77
Glastonbury	E. H. Ruttan	24.11	68	.....	.....	81.8	26	.....	.....
Kingston	A. P. Knight	24.59	110	27.61	106	121.4	70	108.0	73
Cornwall	James Smith, M.A	23.90	114	24.31	120	102.9	90	82.5	69
Pembroke	E. Odlum	21.01	80	45.38	81	98.4	47	66.7	38
Rockliffe	W. H. McIntyre	22.60	106	26.40	97	113.7	69	77.6	50
Lindsay	Thos. Beall	22.01	98	26.73	106	124.2	48	131.0	51
Lakefield	S. Sheldrake	17.80	80	26.17	88	119.0	47	83.0	42
Peterborough	Wm. Tassie, M.A.	25.42	93	13.47	78	84.2	51	63.9	36
L'Amabel	Benjamin Starr	20.93	85	.....	.....	109.5	54	.....	.....
Deseronto	Messrs. Rathbun	23 57	89	28.08	109	123.1	52	88.4	52
Beatrice	J. Hollingworth	26.31	102	31.91	105	216.3	60	229.0	55
Gravenhurst	T. M. Robinson	23.30	93	28.70	100	120.9	68	129.3	69
Bracebridge	W. Simmons	20.36	72	24.95	88	103.6	38	175.3	66
AVERAGE FOR THE PROVINCE		23.68	90	29.08	99	95.5	53	97.6	55
AVERAGE OF TWO YEARS		26.30	94	.....	.....	96.5	54	.....	.....

THE WEATHER.

TABLE No. VI.—Comparative Meteorological Register for the eight years 1877-1884, as recorded at Toronto Observatory, in Latitude 43° 39′.4 North, and Longitude 5h. 17m. 35s. West.

	1884.	1883.	1882	1881.	1880.	1879.	1878.	1877.
Mean Temperature	43.79	41.95	45.42	46.06	45.43	44.16	47.09	46.19
Difference from average (44 years)	— 0.39	— 2.23	+ 1.24	+ 1.88	+ 1.25	— 0.02	+ 2.91	+ 1.92
Thermic anomaly (lat. 43° 40′)	— 7.23	— 9.07	— 5.60	— 4.96	— 5.59	— 6.86	— 3.93	— 4.92
Highest temperature	89.6	83.4	89.9	92.7	89.9	89.5	95.4	88.7
Lowest temperature	— 13.3	— 10.5	— 17.4	— 15.1	— 8.3	— 8.9	— 9.0	13.9
Monthly and annual ranges	102.9	93.9	107.3	107.6	98.2	98.4	104.4	102.6
Mean maximum temperature								
Mean minimum temperature								
Mean daily range	17.05	17.07	15.70	16.61	15.96	17.10	15.11	16.19
Greatest daily range	34.8	38.4	36.0	40.9	30.8	34.1	28.6	33.2
Mean height of Barometer	29.6273	29.6496	29.6515	29.6311	29.6359	29.6353	29.5647	29.6346
Difference from average (43 years)	+.0103	+.0326	+.0345	+.0141	+.0189	+.0183	—.0523	+.0176
Highest barometer	30.412	30.365	30.447	30.461	30.323	30.319	30.123	30.352
Lowest barometer	28.807	28.803	28.781	28.911	28.800	28.948	28.607	28.712
Monthly and annual ranges	1.605	1.562	1.666	1.550	1.523	1.371	1.516	1.640
Mean humidity of the air	76	77	74	75	77	76	77	74
Mean elasticity of aqueous vapour	0.261	0.249	0.265	0.283	0.260	0.267	0.293	0.272
Mean of cloudiness	0.63	0.64	0.63	0.62	0.62	0.63	0.62	0.60
Difference from average (30 years)	+ 0.02	+ 0.03	+ 0.02	+ 0.01	+ 0.01	+ 0.02	— 0.01	— 0.01
Resultant direction of the wind	S 50 W	S 77 W	S 87 W	S 50 W	S 80 W	S 72 W	S 63 W	S 62 W
" velocity of the wind	3.30	2.39	2.11	2.70	2.86	3.18	2.25	1.80
Mean velocity (miles per hour)	10.29	10.08	10.42	9.91	10.54	10.36	8.32	8.33
Difference from average (36 years)	— 2.65	— 2.44	— 2.78	— 2.27	+ 2.90	+ 2.72	+ 0.68	— 0.69
Total amount of rain	20.532	25.734	20.587	21.138	30.922	22.515	43.390	21.885
Difference from average (44 years)	— 7.337	— 2.135	— 7.282	— 6.731	+ 3.053	— 5.354	+15.521	— 5.984
Number of days' rain	123	124	110	123	140	107	132	116
Total amount of snow	80.2	84.0	42.5	57.6	44.0	68.5	51.0	37.3
Difference from average (41 years)	—10.64	+14.54	—27.06	—11.96	—25.56	— 1.06	—18.56	—32.26
Number of days of snow	69	74	62	64	78	79	56	54
Number of fair days	184	181	209	191	163	188	202	204
Number of Auroras observed	20	46	60	23	23	9	7	13
Possible to see Aurora (No. of nights)	202	207	204	187	198	191	195	200
Number of Thunderstorms	30	32	28	24	47	37	30	33
Number of hours Sunshine	1931.8	2038.8	2169.5					
Number of hours of possible Sunshine	4463.3	4463.3	4463.3					

WHEAT.

TABLE VII.—Showing by County Municipalities and groups of Counties the area and produce of Fall Wheat and Spring Wheat in Ontario in the years 1883 and 1884.

COUNTIES.	Fall Wheat.				Spring Wheat.			
	1884.		1883.		1884.		1883.	
	Acres.	Bush.	Acres.	Bush.	Acres.	Bush.	Acres.	Bush.
Essex	30,679	593,332	34,370	443,373	2,593	47,919	1,472	20,608
Kent	60,316	1,337,206	65,617	656,170	2,954	59,819	1,174	13,501
Elgin	41,061	810,134	51,583	577,730	2,017	44,535	614	9,947
Norfolk	32,781	709,709	32,630	293,670	1,175	20,786	585	9,360
Haldimand	31,019	661,635	33,498	224,437	3,832	72,501	1,992	31,075
Welland	19,357	445,211	23,841	183,576	3,012	57,740	988	15,709
Totals	215,213	4,557,227	241,539	2,378,956	15,583	303,300	6,825	100,200
Lambton	30,963	609,042	37,428	359,309	7,851	166,520	3,731	53,726
Huron	61,372	1,542,892	80,886	590,468	30,038	641,612	14,053	237,496
Bruce	48,288	1,036,260	59,606	524,533	17,082	310,209	13,016	191,335
Totals	140,623	3,188,194	177,920	1,474,310	54,971	1,118,341	30,800	482,557
Grey	20,559	438,318	33,286	319,546	53,372	971,904	58,646	926,607
Simcoe	51,324	1,358,033	61,952	675,277	35,503	749,468	32,094	519,923
Totals	71,883	1,796,351	95,238	994,823	88,875	1,721,372	90,740	1,446,530
Middlesex	66,750	1,591,320	88,811	923,634	19,603	452,241	3,923	75,714
Oxford	36,280	941,103	43,853	359,595	19,064	463,827	7,136	149,142
Brant	32,245	811,284	33,047	350,298	1,778	38,743	1,090	15,587
Perth	39,365	1,078,207	48,347	348,098	25,081	599,687	13,606	251,711
Wellington	23,705	567,498	36,811	434,370	29,830	623,149	21,044	347,226
Waterloo	38,388	967,500	42,570	468,270	9,349	197,918	4,751	89,794
Dufferin	10,355	225,532	16,619	202,512	21,234	383,061	20,402	307,179
Totals	247,288	6,212,444	310,058	3,086,777	125,939	2,758,626	71,952	1,236,353
Lincoln	19,602	466,136	24,602	179,595	4,671	90,711	1,247	20,700
Wentworth	30,542	856,398	35,219	454,325	5,047	103,363	1,604	26,306
Halton	21,158	601,099	26,387	327,199	5,159	110,145	2,912	48,922
Peel	25,332	749,128	30,342	449,062	16,157	348,830	13,465	249,103
York	36,178	1,067,613	48,148	606,665	32,628	762,190	25,160	470,492
Ontario	9,622	254,213	18,426	245,066	54,763	1,219,024	45,582	879,733
Durham	1,837	40,524	5,152	79,341	51,236	1,008,324	43,429	833,837
Northumberland	7,519	184,215	12,117	190,237	36,286	653,148	32,505	500,577
Prince Edward	1,701	35,619	3,555	39,816	8,945	161,994	6,980	113,774
Totals	153,991	4,254,945	203,948	2,571,306	214,892	4,457,729	172,884	3,143,444
Lennox and Addington	1,768	33,592	2,547	44,572	8,297	148,184	7,551	100,428
Frontenac	2,132	37,950	2,911	50,651	9,981	176,564	8,681	129,347
Leeds and Grenville	4,817	90,704	7,956	134,456	15,355	296,659	14,155	196,755
Dundas	620	10,143	2,763	48,905	4,433	105,018	3,943	64,665
Stormont	873	15,749	829	16,248	4,259	88,076	3,636	68,720
Glengarry	438	8,948	871	13,936	7,424	136,082	7,132	104,840
Prescott	48	904	19	380	7,349	156,166	8,139	108,249
Russell	295	5,502	452	6,961	4,650	102,832	5,409	67,613
Carleton	315	7,025	4,768	65,798	23,076	542,978	22,490	312,611
Renfrew	398	7,462	3,108	58,430	24,162	475,508	27,081	471,209
Lanark	1,888	33,285	5,310	112,572	13,879	284,140	14,235	182,208
Totals	13,592	251,264	31,534	552,909	122,865	2,512,207	122,452	1,806,645
Victoria	7,343	133,129	14,210	193,940	37,495	676,410	36,126	549,115
Peterborough	8,632	196,896	13,069	215,639	27,951	508,429	23,421	416,894
Haliburton	21	352	43	430	956	15,019	1,294	10,352
Hastings	6,089	125,433	9,127	173,413	22,863	379,983	18,200	342,160
Totals	22,085	455,810	36,449	588,422	89,265	1,579,841	79,041	1,318,521
Muskoka	12	208	29	415	1,688	27,244	1,899	28,295
Parry Sound	27	473	43	632	1,961	37,534	2,909	44,382
Algoma	26	715	452	8,407	5,608	93,467	7,008	119,136
Totals	65	1,396	524	9,454	9,257	158,245	11,716	191,813
The Province	864,740	20,717,631	1,097,210	11,656,957	721,647	14,609,661	586,410	9,726,063

BARLEY AND OATS.

TABLE No. VIII.—Showing by County Municipalities and groups of Counties the area and produce of Barley and Oats in Ontario in the years 1883 and 1884.

COUNTIES.	Barley.				Oats.			
	1884.		1883.		1884.		1883.	
	Acres.	Bush.	Acres.	Bush.	Acres.	Bush.	Acres.	Bush.
Essex	2,501	70,678	2,166	50,468	28,334	1,209,578	23,216	863,635
Kent	5,253	145,351	6,635	137,345	32,795	1,426,583	29,421	1,150,361
Elgin	4,807	140,220	4,051	87,502	32,991	1,419,603	27,026	1,062,122
Norfolk	6,384	194,074	6,606	167,132	26,372	1,025,871	24,874	994,960
Haldimand	14,857	379,151	15,264	276,278	21,487	807,052	19,954	696,395
Welland	5,219	150,464	3,885	96,348	19,281	744,825	17,470	623,679
Totals	39,021	1,079,938	38,607	815,073	161,260	6,633,512	141,961	5,391,152
Lambton	14,244	401,538	15,326	312,650	41,976	1,864,154	31,497	1,152,790
Huron	26,034	732,336	33,519	915,069	70,212	2,668,056	72,975	3,006,570
Bruce	17,872	452,162	19,946	552,504	49,523	1,611,478	53,145	2,051,397
Totals	58,150	1,586,036	68,791	1,780,223	161,711	6,143,688	157,617	6,210,757
Grey	22,548	583,728	23,771	615,669	73,325	2,378,663	74,872	2,695,392
Simcoe	28,689	839,153	29,199	753,334	56,839	2,133,736	54,017	2,074,253
Totals	51,237	1,427,881	52,970	1,369,003	130,164	4,512,399	128,889	4,769,645
Middlesex	13,760	413,626	17,811	384,718	67,188	2,936,787	62,866	2,810,110
Oxford	14,617	466,575	19,963	588,909	47,305	2,030,341	49,101	2,302,837
Brant	13,749	419,894	14,350	344,400	18,198	838,018	16,333	669,653
Perth	18,447	589,013	23,335	618,378	50,457	2,219,099	52,356	2,193,716
Wellington	34,715	1,054,581	32,209	827,771	57,155	2,235,332	59,267	2,240,293
Waterloo	14,083	448,544	16,195	498,806	30,973	1,261,530	31,555	1,378,954
Dufferin	11,006	296,722	9,077	197,225	24,945	852,371	23,499	849,704
Totals	120,375	3,688,955	132,940	3,460,207	296,221	12,373,478	294,977	12,445,267
Lincoln	5,480	143,795	4,382	106,044	18,694	701,399	16,432	607,984
Wentworth	11,185	337,451	10,062	299,848	29,261	1,311,771	25,533	1,072,386
Halton	11,118	330,316	12,113	302,825	17,110	680,294	16,826	656,214
Peel	30,215	834,840	30,069	694,594	26,071	1,039,711	24,675	1,053,623
York	47,952	1,526,792	50,213	1,235,240	58,123	2,555,087	51,396	2,281,982
Ontario	31,056	930,127	33,961	876,194	43,779	1,896,944	42,075	1,830,263
Durham	39,737	1,136,478	38,408	960,200	32,252	1,286,210	30,764	1,193,643
Northumberland	42,848	1,048,919	44,213	910,788	27,853	1,005,190	25,812	965,369
Prince Edward	39,955	830,265	43,850	912,080	14,365	487,548	11,986	356,807
Totals	259,546	7,118,983	267,271	6,297,813	267,608	10,964,154	245,499	9,998,271
Lennox and Addington	42,663	857,526	43,652	925,422	18,478	572,818	18,676	560,280
Frontenac	17,334	373,721	22,238	498,042	24,375	752,700	23,531	823,585
Leeds and Grenville	10,372	282,741	13,614	310,399	59,752	2,357,814	58,226	1,839,942
Dundas	8,221	249,590	9,069	256,653	25,288	1,033,268	27,741	887,712
Stormont	2,245	64,656	3,048	89,002	22,794	869,021	23,541	838,000
Glengarry	2,179	49,572	2,098	54,338	27,555	958,363	27,829	1,001 844
Prescott	2,317	66,984	1,975	45,425	23,941	935,614	24,537	706,666
Russell	1,325	40,293	1,337	33,425	18,103	715,068	17,918	627,130
Carleton	7,103	240,152	7,011	161,253	55,293	2,322,306	47,431	1,954,157
Renfrew	495	11,608	1,299	36,242	38,527	1,386,972	33,851	1,238 947
Lanark	2,020	61,368	2,412	67,054	29,679	1,135,519	31,120	1,086,088
Totals	96,274	2,298,211	107,753	2,477,255	343,785	13,039,463	334,401	11,564,411
Victoria	24,698	656,967	24,415	595,726	33,969	1,205,900	32,369	1,165,284
Peterborough	17,018	313,189	13,771	373,194	26,680	902,051	24,894	1,039,612
Haliburton	219	6,570	309	8,652	4,224	124 312	4,373	144 309
Hastings	36,982	894,595	48,522	1,193,641	40,377	1,274,702	37,935	1,327,725
Totals	73,917	1,871,321	87,017	2,171,213	105,250	3,506,965	99,571	3,667,930
Muskoka	625	14,050	388	8,652	7,499	242,143	7,287	236,099
Parry Sound	721	17,304	842	21,050	4,971	149,130	4,442	143,477
Algoma	606	16,362	577	13,848	3,359	131,372	3,665	146,600
Totals	1,952	47,716	1,807	43,550	15,829	522,645	15,394	526,176
The Province	700,472	19,119,041	757,156	18,414,337	1,481,828	57,696,304	1,418,309	54,573,669

RYE AND PEAS.

TABLE No. IX.—Showing by County Municipalities and groups of Counties the area and produce of Rye and Peas in Ontario in the years 1883 and 1884.

COUNTIES.	Rye.				Peas.			
	1884.		1883.		1884.		1883.	
	Acres.	Bush.	Acres.	Bush.	Acres.	Bush.	Acres.	Bush.
Essex	987	21,359	694	13,186	4,283	95,254	3,078	51,403
Kent	712	14,774	287	4,736	5,968	130,520	4,740	78,210
Elgin	1,066	19,188	1,541	25,272	5,679	145,610	7,424	85,376
Norfolk	7,227	102,985	7,676	101,323	11,734	286,427	9,957	177,517
Haldimand	944	15,274	1,585	22,190	10,066	228,398	9,560	153,916
Welland	516	9,525	530	8,374	3,607	75,747	2,612	50,150
Totals	11,452	183,105	12,313	175,081	41,337	961,956	36,471	596,572
Lambton	329	4,057	341	5,695	5,088	127,607	5,387	61,951
Huron	101	2,525	810	11,421	26,484	660,216	27,379	462,705
Bruce	107	2,140	963	12,519	32,475	753,420	34,843	832,748
Totals	537	8,722	2,114	29,635	64,047	1,541,273	67,609	1,357,404
Grey	391	7,429	1,730	25,950	43,824	1,035,561	43,527	992,416
Simcoe	2,054	32,864	4,086	71,914	30,680	796,760	26,325	616,005
Totals	2,445	40,293	5,816	97,864	74,504	1,832,321	69,852	1,608,421
Middlesex	294	5,845	831	11,883	11,955	289,789	15,534	169,321
Oxford	1,024	16,384	1,722	20,664	10,241	265,652	9,726	162,424
Brant	603	10,142	1,095	14,783	8,133	208,205	6,569	123,497
Perth	124	2,480	576	8,064	17,931	502,068	20,359	293,170
Wellington	639	13,560	1,565	24,414	33,149	898,669	33,815	541,040
Waterloo	504	9,828	935	14,306	11,889	313,632	11,767	249,460
Dufferin	838	14,523	1,360	22,554	10,493	206,541	11,059	230,323
Totals	4,026	72,762	8,084	116,668	103,791	2,684,556	108,829	1,769,235
Lincoln	613	11,739	1,058	14,283	4,170	97,995	3,236	62,131
Wentworth	1,157	18,824	1,601	24,495	8,295	188,131	8,124	162,480
Halton	238	4,363	995	16,915	9,950	246,959	8,574	231,498
Peel	865	17,914	3,262	61,978	12,642	317,693	9,982	201,636
York	1,492	25,364	4,464	59,371	24,831	670,934	21,781	455,223
Ontario	2,640	48,101	5,935	96,741	21,978	559,999	21,984	485,846
Durham	2,647	39,917	10,170	143,397	18,382	433,080	20 074	371,369
Northumberland	10,250	135,813	19,450	270,355	19,569	421,712	16,899	349,809
Prince Edward	10,087	137,284	14,299	200,186	6,967	147,491	3,910	74,290
Totals	29,989	439,319	61,234	887,721	126,784	3,083,994	114,564	2,394,282
Lennox and Addington	5,582	85,126	8,984	141,049	8,218	165,921	6,687	130,397
Frontenac	4,855	68,601	7,098	113,568	12,908	266,163	9.565	185.561
Leeds and Grenville	6,867	104,378	14,549	258,972	7,082	146,881	6,519	128,424
Dundas	1,903	41,105	2,533	72,444	1,761	48,181	2,146	48,285
Stormont	605	13,298	820	21,484	3,503	83,652	2,656	58,432
Glengarry	103	2,264	121	2.856	5,927	124,467	6,600	108,900
Prescott	545	12,715	405	7,290	9,844	246,100	11,369	151,208
Russell	236	4,720	925	18,500	6,510	160,992	4,369	76,458
Carleton	7,511	137,001	9,796	151,838	14,605	379,214	12,306	243,659
Renfrew	6,415	128,300	10,190	197,686	22,893	502,731	20,044	479,052
Lanark	4,811	70,144	8,054	173,161	11,498	249,277	10,795	274,193
Totals	39,433	667,652	63,475	1,158,848	104,749	2,373,579	93,056	1,884,569
Victoria	884	13,614	2,370	37,209	15,185	361,555	14,939	295,792
Peterborough	2,847	43,274	5,701	91,786	14,487	313,354	13,569	299,875
Haliburton	260	4,810	462	9,240	1,518	32,531	1,420	35,500
Hastings	10,390	150,032	24,558	368,370	17,665	338,108	14,739	265,302
Totals	14,381	211,730	33,091	506,605	48,855	1,045,548	44,667	896,469
Muskoka	461	8,298	814	16 117	2,858	62,762	2,525	47,218
Parry Sound	624	14,508	968	20,328	1,352	30,515	1,686	34,563
Algoma	68	1,870	202	3,373	2,651	75,103	3.512	84,990
Totals	1,153	24,676	1,984	39,818	6,861	168,380	7,723	166,771
The Province	103,416	1,648,259	188,111	3,012,240	570,928	13,691,607	542,771	10,673,723

CORN, BUCKWHEAT AND BEANS.

TABLE No. X.—Showing by County Municipalities and groups of Counties the area and produce of Corn, Buckwheat and Beans in Ontario in the years 1883 and 1884.

COUNTIES.	CORN.			BUCKWHEAT.			BEANS.		
	1884.		1883.	1884.		1883.	1884.		1883.
	Acres.	Bush.	Acres.	Acres.	Bush.	Acres.	Acres.	Bush.	Acres.
Essex	31,292	2,530,271	27,121	584	11,633	831	533	13,325	351
Kent	27,213	2,333,243	26,416	878	27,218	969	10,240	242,586	10,835
Elgin	14,532	1,148,028	16,178	1,119	29,933	1,455	1,376	34,400	1,190
Norfolk	12,326	921,738	16,449	5,307	99,135	5,462	975	16,136	1,988
Haldimand	1,951	138,365	3,273	789	15,701	933	244	7,117	232
Welland	6,569	515,075	8,510	1,938	40,446	1,870	1,304	23,720	1,350
Totals	93,883	7,586,720	97,947	10,615	224,066	11,520	14,672	337,284	15,946
Lambton	7,397	491,60	9,001	534	15,486	423	399	9,975	387
Huron	2,041	141,421	2,899	195	3,510	376	160	4,640	114
Bruce	215	6,809	605	166	3,597	402	86	1,290	166
Totals	9,653	639,835	12,505	895	22,593	1,201	645	15,905	667
Grey	231	11,550	547	297	5,495	443	69	966	127
Simcoe	492	33,210	955	287	4,305	240	153	3,060	138
Totals	723	44,760	1,502	584	9,800	683	222	4,026	265
Middlesex	9,875	782,100	13,266	502	10,542	492	456	8,801	512
Oxford	8,049	539,283	11,594	781	20,697	823	357	9,150	517
Brant	3,608	255,013	6,187	863	17,605	802	1,187	24,701	1,284
Perth	515	33,763	1,101	156	4,524	72	99	3,119	40
Wellington	794	51,610	864	186	4,929	176	12	444	64
Waterloo	1,487	98,781	2,250	112	2,800	136	25	625	96
Dufferin	23	1,610	177	73	1,241	57	3	60	22
Totals	24,351	1,762,160	35,439	2,673	62,338	2,558	2,139	46,900	2,535
Lincoln	6,010	444,019	7,689	971	21,886	1,209	205	5,408	180
Wentworth	4,239	339,120	6,016	617	11,723	997	169	4,129	155
Halton	686	54,880	1,357	129	2,365	226	23	519	60
Peel	278	20,850	498	295	5,997	377	107	4,280	61
York	1,048	71,264	1,784	586	15,529	316	214	9,288	202
Ontario	1,720	106,967	3,072	369	7,318	439	556	14,762	623
Durham	1,749	106,532	2,642	615	10,658	762	384	7,891	635
Northumberland	3,391	246,627	5,172	3,706	85,532	3,720	810	20,825	678
Prince Edward	5,412	283,535	10,450	7,003	165,201	4,820	380	13,300	334
Totals	24,533	1,673,794	38,680	14,291	326,209	12,866	2,848	80,402	2,928
Lennox and Addington	1,508	78,703	3,016	2,549	65,739	2,752	112	2,856	97
Frontenac	1,186	64,566	1,680	1,445	33,640	1,674	228	5,887	230
Leeds and Grenville	4,605	308,075	5,272	6,391	139,335	6,612	391	9,998	286
Dundas	1,221	102,564	1,528	1,607	36,607	1,388	175	4,667	195
Stormont	1,267	57,015	1,268	2,102	47,295	2,697	321	9,388	50
Glengarry	935	38,569	922	847	19,693	1,665	119	3,868	203
Prescott	1,336	80,334	1,401	1,857	54,354	2,101	547	17,641	615
Russell	527	28,985	551	1,534	34,515	969	440	11,000	330
Carleton	1,155	57,750	1,126	4,466	97,493	3,436	630	15,385	349
Renfrew	339	16,611	658	743	15,046	1,453	596	11,175	477
Lanark	1,052	65,371	1,614	7,873	178,245	7,321	192	3,327	204
Totals	15,131	898,543	19,036	31,414	722,462	32,068	3,751	95,292	2,965
Victoria	399	20,449	527	636	13,197	296	107	2,668	178
Peterborough	341	19,324	332	661	17,629	657	173	3,028	79
Haliburton	102	5,100	154	264	5,412	246	17	340	16
Hastings	5,059	268,127	7,648	3,118	61,830	4,965	236	5,050	252
Totals	5,901	313,000	8,661	4,679	98,068	6,164	533	10,486	525
Muskoka	223	8,697	292	420	12,029	356	44	979	56
Parry Sound	28	1,680	90	189	4,725	259	18	720	17
Algoma	134	6,700	85	76	2,280	127	6	150	3
Totals	385	17,077	467	685	19,034	742	68	1,849	76
THE PROVINCE	174,560	12,935,889	214,237	65,836	1484570	67,802	24,878	592,044	25,907

POTATOES AND MANGOLD WURTZELS.

TABLE No. XI.—Showing by County Municipalities and groups of Counties the area and produce of Potatoes and Mangold Wurtzels in Ontario in the years 1883 and 1884.

COUNTIES.	Potatoes.				Mangold Wurtzels.			
	1884.		1883		1884.		1883.	
	Acres.	Bush.	Acres.	Bush.	Acres.	Bush.	Acres.	Bush.
Essex	3,180	505,843	3 004	303,404	200	94,706	164	49,200
Kent	4,217	740,716	3,811	461,131	365	151,614	126	32,382
Elgin	3,340	526,852	3,052	228,900	303	141,010	275	47,300
Norfolk	4,750	643,388	3,800	383,800	192	61,576	157	70,650
Haldimand	1,809	246,024	1,648	182,928	164	67,065	76	18,544
Welland	3,089	434,653	2,318	257,298	83	31,604	145	50,750
Totals	20,385	3,097,476	17,633	1,817,461	1,307	547,575	943	268,826
Lambton	3,723	587,787	3,054	253,482	419	164,805	321	73,830
Huron	5,186	671,743	5,838	507,906	1,532	696,248	1,428	522,648
Bruce	4,930	526,179	5,166	656,082	414	163,530	551	231,420
Totals	13,839	1,785,709	14,058	1,417,470	2,365	1,024,583	2,300	827,898
Grey	7,040	859,936	7,622	785,066	359	195,723	476	211,344
Simcoe	7,361	1,226,490	7,064	755,848	651	314,921	909	289,062
Totals	14,401	2,086,426	14,686	1,540,914	1,010	510,644	1,385	500,406
Middlesex	5,945	1,068,554	6,259	469,425	1,280	595,750	1,112	371,408
Oxford	3,875	671,848	3,946	248,598	1,030	526,701	1,013	341,381
Brant	2,584	446,825	2,184	251,160	419	254,019	290	129,920
Perth	3,929	715,274	4,595	289,485	1,448	793,403	1,253	305,732
Wellington	6,800	1,009,460	6,386	638,600	886	457,123	743	275,653
Waterloo	2,948	488,130	3,236	307,420	446	202,185	496	198,400
Dufferin	3,448	538,026	3,298	497,038	173	63,721	137	45,261
Totals	29,529	4,938,117	29,904	2,701,726	5,682	2,892,902	5,044	1,667,755
Lincoln	2,426	356,428	2,154	161,550	389	126,611	157	53,380
Wentworth	4,411	687,543	4,184	456,056	442	222,472	500	262,500
Halton	1,849	286,059	1,765	229,450	400	182,668	424	127,200
Peel	3,262	550,658	3,067	285,231	379	206,081	409	118,610
York	7,432	1,289,972	8,505	552,825	1,736	896,939	1,507	699,248
Ontario	4,354	818,552	4,317	345,360	778	409,843	814	353,276
Durham	3,482	646,956	3,364	255,664	409	184,803	479	186,331
Northumberland	4,575	822,402	4,747	474,700	455	219,915	440	179,080
Prince Edward	2,434	305,759	2,645	277,725	130	37,700	125	20,750
Totals	34,225	5,764,329	34,748	3,038,561	5,118	2,487,032	4,855	2,000,375
Lennox and Addington	3,342	525,530	3,440	240,800	102	27,540	214	85,600
Frontenac	4,026	637,960	4,167	333,360	179	58,175	97	38,800
Leeds and Grenville	7,618	1,382,515	8,015	777,455	261	133,512	222	95,486
Dundas	2,462	566,260	2,557	271,042	90	30,600	105	43,260
Stormont	2,341	292,625	1,955	258,060	45	16,038	24	7,200
Glengarry	2,428	446,485	2,570	346,950	34	13,600	65	19,500
Prescott	2,472	514,992	2,270	254,240	86	25,800	23	6,900
Russell	1,655	248,250	1,649	123,675	160	25,390	64	19,200
Carleton	6,798	1,319,968	5,847	584,700	479	222,893	561	224,400
Renfrew	3,623	651,379	3,932	487,568	111	35,458	141	61,053
Lanark	4,040	775,438	3,652	474,760	210	97,650	144	52,722
Totals	40,805	7,361,402	40,054	4,152,610	1,657	686,656	1,690	654,095
Victoria	2,778	526,264	3,108	317,016	496	239,246	460	176,180
Peterborough	2,696	457,996	2,483	268,164	345	148,581	263	83,634
Haliburton	748	181,659	676	50,700	3	900	5	1,500
Hastings	6,443	858,143	6,538	725,718	299	95,082	177	44,250
Totals	12,665	2,024,062	12,805	1,361,598	1,143	483,809	905	305,564
Muskoka	1,434	230,372	1,291	151,047	31	7,750	42	14,196
Parry Sound	798	137,655	901	119,833	4	1,433	36	7,200
Algoma	676	120,713	743	99,562	24	12,800	19	5,700
Totals	2,908	488,740	2,935	370,442	59	21,983	97	27,096
The Province	168,757	27,546,261	166,823	16,400,782	18,341	8,655,184	17,219	6,252,015

CARROTS AND TURNIPS.

TABLE No. XII.—Showing by County Municipalities and groups of Counties the area and produce of Carrots and Turnips in Ontario in the years 1883 and 1884.

COUNTIES.	Carrots.				Turnips.			
	1884.		1883.		1884.		1883.	
	Acres.	Bush.	Acres.	Bush.	Acres.	Bush.	Acres.	Bush.
Essex	101	34,146	54	10,800	231	72,698	207	41,400
Kent	144	38,493	102	22,236	672	230,617	304	73,568
Elgin	159	54,855	116	13,340	510	210,270	81	38,337
Norfolk	136	31,911	126	56,700	661	253,883	526	238,400
Haldimand	76	27,000	65	7,605	107	41,705	65	18,850
Welland	90	23,114	62	9,796	196	52,725	113	33,900
Totals	708	209,519	525	120,477	2,377	831,498	1,608	444,555
Lambton	181	60,032	158	28,914	398	152,505	283	70,750
Huron	708	281,519	586	234,400	7,729	2,748,568	7,421	2,120,827
Bruce	324	93,419	411	150,837	6,307	1,996,607	5,708	2,106,252
Totals	1,213	434,970	1,155	414,151	14,434	4,897,740	13,412	4,297,829
Grey	500	247,800	768	350,208	9,249	3,982,249	8,001	3,008,572
Simcoe	68	273,507	765	283,050	3,397	1,497,194	3,090	1,013,520
Totals	1,273	521,307	1,533	633,258	12,646	5,479,443	12,052	4,022,092
Middlesex	548	185,087	505	137,865	1,436	589,564	1,749	510,708
Oxford	347	137,450	413	174,286	4,952	2,283,021	5,250	1,998,995
Brant	310	142,048	211	79,125	2,456	1,253,665	2,670	745,200
Perth	442	213,738	406	109,214	5,623	2,792,550	5,437	772,054
Wellington	551	132,933	380	108,300	13,548	6,196,313	13,899	3,836,124
Waterloo	379	97,650	377	167,388	5,469	2,168,975	5,226	1,566,464
Dufferin	248	69,020	206	81,595	2,340	986,146	2,575	807,872
Totals	2,504	977,926	2,498	857,773	35,824	16,269,334	36,453	9,133,517
Lincoln	141	36,801	95	30,875	330	96,713	157	47,100
Wentworth	225	91,007	249	107,517	1,882	868,791	1,950	803,850
Halton	126	46,350	115	46,000	1,740	739,500	1,475	570,825
Peel	226	14,571	343	83,006	1,321	660,408	1,150	278,600
York	780	340,938	898	391,266	2,009	1,232,518	2,851	778,323
Ontario	673	305 172	610	254,370	11,886	5,562,648	10,246	3,411,918
Durham	442	179,673	584	216,080	5,131	2,479,197	4,041	1,800,195
Northumberland	270	83,249	275	91,575	2,983	1,314,399	2,440	820,415
Prince Edward	57	9,957	50	9,750	135	26,700	76	8,512
Totals	3,010	1,235.421	3,219	1,200,469	27,997	12,980,874	25,025	8.552,468
Lennox and Addington	55	12,100	41	8,200	338	74,360	142	21,300
Frontenac	76	17,670	130	32,500	192	43,680	239	41,825
Leeds and Grenville	164	55,507	168	50,400	212	93,045	177	72,924
Dundas	36	14,850	43	12,900	126	33,600	32	11,200
Stormont	93	34,875	18	3,600	259	51,800	14	2,800
Glengarry	54	18,900	20	5,000	22	6,600	18	3,060
Prescott	58	16.779	31	10.850	140	54,834	51	14,883
Russell	125	49 411	100	25,000	407	149 906	234	58,500
Carleton	527	218,178	554	221,600	1,214	501,783	1,309	392,700
Renfrew	127	36.195	142	54,386	848	301,888	536	160,800
Lanark	155	58,900	147	40,866	472	174,640	418	148,390
Totals	1,470	533,365	1,394	465,302	4,230	1,486,136	3,170	926,282
Victoria	251	93,329	265	98,050	2,318	982,923	3,113	809,380
Peterborough	319	113,644	371	125,398	825	328,969	868	329,840
Haliburton	17	5,100	23	5,750	309	104,288	305	54,900
Hastings	98	27,549	109	27,250	590	162,445	523	104,600
Totals	685	242,632	768	256,448	4,042	1,578,325	4,809	1,298,720
Muskoka	77	25,127	86	19,608	1,086	341,840	786	202,002
Parry Sound	19	7,600	58	10.150	1,041	302,546	623	176,309
Algoma	28	9,333	34	6,800	522	238,627	491	186,580
Totals	124	42,060	178	36,558	2,649	883,013	1,900	564,891
The Province	10,987	4,197,200	11,270	3,984,436	104,199	44,406,363	98,429	29,879,354

MISCELLANEOUS.

TABLE No. XIII.—Showing by County Municipalities and groups of Counties the area and produce of Hay and Clover, the area of Orchard and Garden in the years 1883 and 1884; the area of Pasture in 1884, and the quantity of Butter made in the years 1882 and 1883.

COUNTIES.	Hay and Clover.				Pasture, Acres, 1884.	Butter Made, Lbs.		Orchard and Garden, Acres.	
	1884.		1883.						
	Acres.	Tons.	Acres	Tons.		1883.	1882.	1884.	1883.
Essex	34,411	51,960	36,739	61,722	46,864	611,030	591,989	5,814	6,081
Kent	51,744	81,237	53,341	85,346	69,097	718,311	805,250	8,117	7,432
Elgin	49,255	77,822	53,129	84,475	77,510	551,729	597,445	6,951	7,360
Norfolk	41,116	66,813	49,711	77,549	44,788	520,248	531,115	7,969	7,935
Haldimand	49,968	80,948	55,836	78,170	40,372	798,526	712,794	4,755	4,995
Welland	45,196	77,737	46,243	73,989	31,065	531,552	577,248	6,406	6,281
Totals	271,690	436,517	294,999	461,251	309,696	3,731,396	3,815,841	39,952	40,084
Lambton	57,751	84,316	52,388	90,107	90,831	796,666	678,676	5,896	6,031
Huron	89,027	124,637	101,013	161,621	141,278	1,529,723	1,612,757	8,624	7,849
Bruce	73,461	85,949	86,576	134,193	95,992	1,198,974	1,339,214	5,432	6,027
Totals	220,239	294,902	239,977	385,921	328,101	3,525,363	3,630,647	19,952	19,907
Grey	108,984	130,780	114,151	180,359	133,244	1,949,789	2,031,549	7,160	7,347
Simcoe	72,893	109,339	79,970	140,747	79,200	1,356,704	1,271,918	4,417	4,881
Totals	181,877	240,119	194,121	321,106	212,444	3,306,493	3,303,467	11,577	12,228
Middlesex	85,547	139,441	95,854	173,496	178,001	1,254,549	1,300,960	10,966	10,534
Oxford	60,570	90,855	68,663	122,907	104,277	658,857	757,498	8,728	8,795
Brant	31,300	54,149	39,150	73,602	33,736	575,350	539,898	4,750	5,260
Perth	65,780	103,368	73,966	139,056	86,036	1,014,602	947,237	4,964	5,668
Wellington	79,941	120,710	88,547	177,980	91,679	1,198,513	1,236,680	5,181	5,136
Waterloo	41,781	79,801	49,766	96,048	36,702	613,040	691,191	5,450	5,693
Dufferin	30,890	41,392	34,546	67,203	40,402	492,178	558,601	1,589	1,714
Totals	395,809	629,716	450,492	850,292	570,833	5,807,089	6,032,065	41,628	42,800
Lincoln	40 044	60,066	42,608	51,130	28,630	601,258	578,531	8,057	7,808
Wentworth	43,357	73,707	50,923	98,281	44,379	753,051	749,147	9,340	9,529
Halton	35,826	57,680	38,065	68,898	38,601	534,657	480,250	4,721	4,829
Peel	37,816	53,699	43,915	92,661	34,667	701,188	625,503	4,000	4,001
York	72,259	113,447	77,902	136,329	71,460	1,321,600	1,238,282	7,394	9,239
Ontario	50,822	77,249	59,846	104,731	67,936	837,308	884,354	5,457	5,492
Durham	47,444	62,152	50,953	96,811	53,913	650,501	632,904	3,908	3,906
Northumberland	55,154	70,597	57,745	88,350	62,609	599,068	606,530	6,405	6,757
Prince Edward	29,967	34,762	30,913	51,625	35,816	365,131	368,726	5,830	5,777
Totals	412,689	603,359	452,870	788,816	438,011	6,363,762	6,162,227	55,112	57,358
Lennox and Addington	41,681	43,765	43,458	74,748	63,711	402,189	479,101	2,767	2,810
Frontenac	57,399	67,731	59,855	110,732	61,898	606,532	632,162	2,164	2,343
Leeds and Grenville	105,357	122,214	103,568	192,636	154,231	1,228,148	1,511,629	3,210	3,410
Dundas	33,424	43,785	33,912	66,807	41,960	1,064,625	1,310,038	1,338	1,313
Stormont	30,889	42,936	28,281	57,410	39,276	458,730	694,885	1,029	1,216
Glengarry	33,197	45,148	32,811	73,825	48,167	229,445	297,325	634	704
Prescott	28,827	38,916	29,584	59,168	37,627	439,500	367,501	222	149
Russell	18,153	20,422	19,629	37,295	22,507	324,765	450,166	113	114
Carleton	53,178	59,559	56,585	94,497	87,307	1,119,169	1,238,686	593	467
Renfrew	59,220	54,482	62,217	112,613	62,423	817,420	918,248	1,043	897
Lanark	60,441	75,551	53,169	105,275	105,237	905,268	944,413	1,207	1,337
Totals	521,766	614,509	523,069	985,006	724,344	7,595,791	8,844,154	14,320	14,760
Victoria	38,080	38,460	40,042	68,472	47,941	608,372	632,728	2,299	2,022
Peterborough	37,958	35,300	39,847	70,928	46,477	549,756	579,770	1,954	2,025
Haliburton	8,794	9,058	9,687	12,884	5,022	112,159	119,791	62	78
Hastings	66,547	97,824	64,414	107,571	95,636	736,346	698,866	5,465	5,825
Totals	151,379	180,642	153,990	259,855	195,076	2,006,633	2,031,155	9,780	9,950
Muskoka	19,392	18,616	20,759	34,045	8,456	259,116	233,388	398	265
Parry Sound	9,818	11,290	10,536	14,039	4,232	129,824	138,281	48	50
Algoma	8,710	15,242	10,136	15,204	3,693	118,802	144,313	70	48
Totals	37,920	45,148	41,451	63,288	16,481	507,742	515,982	516	363
The Province	2,193,369	3,044,912	2,350,969	4,115,535	2,794,986	32,844,269	34,335,538	192,837	197,450

ORCHARD AND GARDEN.

TABLE No. XIV.—Showing the acreage of Orchard and Garden in Ontario, according to the Census Returns for 1851, 1861, 1871 and 1881.

COUNTIES.	1881.			1871.			1861.			1851.		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
	Acr's.	Acr's.	Acr's.	Acr's.	Acr's.	Acr's.	Acr's.	Acr's.	Acr's.	Acr's.	Acr's.	Acr's.
Essex	8,077	768	8,845	5,163	242	5,405	2,222	125	2,347	1,251	.....	1,251
Kent	9,979	618	10,597	7,022	85	7,107	2,542	.....	2,542	1,571	.....	1,571
Elgin	9,991	471	10,462	7,260	95	7,355	3,550	.....	3,550	2,886	.....	2,886
Norfolk	10,714	638	11,352	8,375	122	8,497	4,387	.....	4,387	2,317	41	2,358
Haldimand	6,173	321	6,494	4,502	169	4,671	2,013	.....	2,013	1,387	.....	1,387
Welland	8,404	670	9,074	5,746	347	6,093	3,823	52	3,875	1,552	.....	1,552
Lambton	9,126	1,018	10,144	5,872	158	6,030	1,298	.....	1,298	614	.....	614
Huron	11,891	1,042	12,933	8,418	181	8,599	1,908	.....	1,908	336	.....	336
Bruce	8,491	989	9,390	4,407	175	4,582	383	.....	383	58	.....	58
Grey	10,408	742	11,150	5,405	164	5,569	492	.....	492	56	.....	56
Simcoe	8,431	887	9,318	4,848	282	5,130	1,174	9	1,183	677	.....	677
Middlesex	15,576	1,020	16,596	11,908	257	12,165	5,030	9	5,039	2,388	.....	2,388
Oxford	11,388	995	12,383	9,768	478	10,246	4,578	61	4,639	3,022	70	3,092
Brant	6,572	80	6,652	5,101	107	5,208	2,917	.....	2,917	2,213	.....	2,213
Perth	7,397	833	8,230	5,249	512	5,761	1,610	38	1,648	625	.....	625
Wellington	7,558	737	8,295	5,065	89	5,154	1,613	.....	1,613	834	.....	834
Waterloo	6,558	1,040	7,598	5,727	655	6,382	3,489	157	3,646	1,733	12	1,745
Dufferin	2,583	185	2,768	1,041	56	1,097	241	.....	241	94	.....	94
Lincoln	9,546	718	10,264	6,513	212	6,725	3,510	.....	3,510	2,122	.....	2,122
Wentworth	10,435	41	10,476	7,200	81	7,281	3,025	.....	3,025	2,625	.....	2,625
Halton	5,904	762	6,666	4,384	238	4,622	2,446	36	2,482	1,514	.....	1,514
Peel	5,764	281	6,045	4,430	115	4,545	2,978	43	3,021	2,393	.....	2,393
York	12,746	590	13,336	9,360	205	9,565	4,996	8	5,004	3,576	.....	3,576
Ontario	7,703	953	8,656	5,662	505	6,167	2,711	127	2,838	1,916	34	1,950
Durham	6,069	643	6,652	4,732	407	5,139	2,616	44	2,660	1,719	15	1,734
Northumberland	9,638	1,152	10,790	7,306	531	7,837	3,010	109	3,119	2,544	.....	2,544
Prince Edward	8,432	365	8,797	6,096	230	6,326	3,160	5	3,165	2,572	24	2,596
Lennox and Addington	4,775	298	5,073	4,114	164	4,278	2,500	.....	2,500	2,545	.....	2,545
Frontenac	4,201	78	4,279	2,933	40	2,973	1,101	.....	1,101	653	.....	653
Leeds and Grenville	6,728	344	7,072	5,218	138	5,356	2,117	8	2,125	1,593	.....	1,593
Dundas	1,948	161	2,109	1,354	117	1,471	814	46	860	963	.....	963
Stormont	1,795	57	1,852	1,274	37	1,311	485	.....	485	577	27	604
Glengarry	1,313	.....	1,313	868	.....	868	295	.....	295	288	.....	288
Prescott	843	74	917	645	23	668	212	11	223	186	.....	186
Russell	546	.....	546	176	.....	176	64	.....	64	15	.....	15
Carleton	2,599	26	2,625	1,242	18	1,260	282	3	285	165	9	174
Renfrew	1,880	178	2,058	962	46	1,008	104	.....	104	77	.....	77
Lanark	2,160	207	2,367	1,782	272	2,054	414	1	415	669	22	691
Victoria	3,573	414	3,987	2,337	111	2,448	553	.....	553	232	.....	232
Peterborough	3,325	358	3,683	2,282	219	2,501	841	.....	841	579	6	585
Haliburton	303	.....	303	60	.....	60	5	.....	5	.....	.....	.....
Hastings	8,182	273	8,455	5,730	108	5,838	6,433	15	6,448	1,893	.....	1,893
Muskoka	503	17	520	59	.....	59	7	.....	7	.....	.....	.....
Parry Sound	595	.....	595	25	.....	25	.....	.....	.....	.....	.....	.....
Algoma	802	.....	802	64	.....	64	9	.....	9	.....	.....	.....
Nipissing	66	.....	66	11	.....	11	.....	.....	.....	.....	.....	.....
CITIES.												
Belleville	.....	231	231	.....	90	90	.....	2	2	.....	62	62
Brantford	.....	290	290	.....	221	221	.....	.....	.....	.....	.....	.....
Guelph	.....	382	382	.....	178	178	.....	.....	.....	.....	.....	.....
Hamilton	.....	165	165	.....	108	108	.....	.....	.....	.....	.....	.....
Kingston	.....	22	22	.....	55	55	.....	.....	.....	.....	.....	.....
London	.....	157	157	.....	69	69	.....	.....	.....	.....	.....	.....
Ottawa	.....	15	15	.....	1	1	.....	.....	.....	.....	.....	.....
St. Catharines	.....	453	453	.....	273	273	.....	.....	.....	.....	.....	.....
St. Thomas	.....	357	357	.....	159	159	.....	.....	.....	.....	129	129
Toronto	.....	148	148	.....	170	170	.....	.....	.....	.....	.....	.....
The Province	281,541	23,264	304,805	197,696	9,315	207,011	87,958	909	88,867	55,010	451	55,461

AVERAGE PRODUCTION.

TABLE No. XV.—Showing by County Municipalities and groups of Counties the average production of Field Crops per acre in the years 1883 and 1884.

COUNTIES.	Fall Wheat. Bush.		Spring Wheat. Bush.		Barley. Bush.		Oats. Bush.		Rye. Bush.		Peas. Bush.		1884. Corn (in ear).	1884. Buckwheat.	1884. Beans.
	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884	1883.	1884.	1883			
Essex	19.3	12.9	18.5	14.0	28.3	23.3	42.7	37.2	21.6	19.0	22.2	16.7	80.9	19.9	25.0
Kent	22.2	10.0	20.3	11.5	27.7	20.7	43.5	39.1	20.8	16 5	21.9	16.5	85.7	31.0	23.7
Elgin	19 7	11.2	22.1	16.2	29.2	21.6	43.0	39.3	18.0	16.4	25 6	11 5	79.0	26.8	25.0
Norfolk	21.7	9.0	17.7	16.0	30.4	25.3	38.9	40.0	14.3	13.2	24.4	19.6	74.8	18.7	16.6
Haldimand	21.3	6.7	18 9	15.6	25.5	18.1	37 6	34.9	16.2	14.0	22.7	16.1	70.9	19.9	29.2
Welland	23.0	7.7	19.2	15.9	28.8	24.8	38.6	35.7	18.5	15.8	21.0	19.2	78.4	20.9	18.2
Averages	21.2	9.8	19.5	14.7	27.7	21.1	41.1	38.0	16.0	14.2	23.2	16.4	80.8	21.1	23.0
Lambton	19.7	9.6	21.2	14.4	28.2	20.4	44.4	36.6	12.3	16.7	25.1	11.5	68.5	29.0	25.0
Huron	25 1	7.3	21.4	16 9	28.1	27 3	38.0	41.2	25.0	14.1	24.9	16.9	69.3	18 0	29.0
Bruce	21.5	8.8	18.2	14.7	25.3	27.7	32.5	38.6	20.0	13.0	23.2	23.9	84.7	21.7	15.0
Averages	22.7	8.3	20.3	15.7	27.3	25.9	38.0	39.4	16.2	14.0	24.1	20.1	66.3	25.2	24.7
Grey	21.3	9.6	18.2	15.8	26.1	25.9	32.4	36.0	19.0	15.0	23.6	22.8	50.0	18.5	14.0
Simcoe	26.5	10.9	21.1	16 2	29.3	25.8	37.5	38.4	16.0	17.6	26.0	23.4	67.5	15.0	20.0
Averages	25.0	10.4	19.4	15.9	27.9	25.8	34.7	37.0	16.4	16.8	24.6	23.1	61.9	16.8	18.1
Middlesex	23.8	10.4	23.1	19.3	30.1	21.6	43.7	44.7	19.9	14 3	24.2	10.9	79.2	21.0	19.3
Oxford	25.9	8.2	24.3	20.9	31.9	29.5	42.9	46 9	16.0	12.0	25.9	16.7	67 0	26.5	25.6
Brant	25.2	10 6	21.8	14.3	30.5	24.0	46 0	41.0	16.8	13.5	25 6	18.8	70.7	20.4	20.8
Perth	27.4	7.2	23.9	18.5	31.9	26.5	44.0	41.9	20.0	14.0	28.0	14.4	65.6	29.0	31.5
Wellington	23.9	11.8	20.9	16.5	30.4	25.7	39.1	37.8	21.2	15 6	27.1	16.0	65.0	26.5	37.0
Waterloo	25.8	11.0	21.2	18.9	31.8	30.8	40.7	43.7	19.5	15.3	26 4	21.2	66.4	25.0	25 0
Dufferin	21.8	12.2	18.0	15.6	27.0	21.7	34.2	36.2	17.3	16.6	24.8	20 8	70.0	17.0	20.0
Averages	25.1	10.0	21.9	17.2	30.6	26 0	41 8	42.2	18.1	14.4	25.9	16.3	72.4	23.3	21.9
Lincoln	23.8	7.3	19.4	16.6	26.2	24.2	37.5	37.0	19.2	13.5	23.5	19.2	73 9	22.5	26.4
Wentworth	28.0	12.9	20.5	16.4	30.2	29.8	44.8	42.0	16.3	15.3	22.7	20.0	80.0	19.0	34.4
Halton	28.4	12.4	21.4	16 8	29.7	25.0	39 8	39.6	18.3	17.0	24.8	27.0	80.0	18.3	22.5
Peel	29.0	14.8	21.6	18.5	27.6	23.1	39.9	42.7	20.7	19.0	25.1	20.2	75.0	20.3	40.0
York	29.5	12.6	23.4	18.7	31 8	24.6	44.0	44.4	17.0	13.3	27.0	20.9	68.0	26.5	43.4
Ontario	26.4	13.3	22.3	19.3	30.0	25.8	43 3	43 5	18.2	16.3	25.5	22 1	62.2	19.9	26.5
Durham	22.1	15.4	19.7	19.2	28 6	25 0	39.9	38.8	15.1	14.1	23.6	18.5	60.9	17.3	20.5
Northumberland	24.5	15.7	18.0	15.4	24.5	20.6	36.0	37.4	13.3	13.9	21.5	20.7	72.7	22.0	25.7
Prince Edward	20 9	11.2	18.1	16.3	20 8	20.8	33.9	28.1	13.6	14.0	21.2	19.0	52.4	23.6	35.0
Averages	27.6	12 6	20.7	18.2	27.4	23.6	41.0	40.7	14.6	14.5	24 3	20.9	68.2	22.8	28.2
Lennox and Addington	19 0	17.5	17.9	13.3	20.1	21.2	31.0	30 0	15.3	15.7	20.2	19.5	52.2	25.8	25.5
Frontenac	17.8	17.4	17.7	14 9	21.6	22.4	30.9	35.0	14.1	16.0	20.6	19.4	54.4	23.3	25.8
Leeds and Grenville	18.8	16.9	19.3	13.9	27.3	22.8	39.5	31 6	15.2	17.8	20.7	19.7	66.9	21.9	25.6
Dundas	16 4	17.7	23.7	16.4	30.4	28 3	40.9	32.0	21.6	28.6	27.4	22.5	84.0	22.8	26.7
Stormont	18 0	19.6	20.7	18.9	28.8	29 2	38.1	35.6	22.0	26.2	23 9	22.0	45.0	22.5	29.2
Glengarry	20.4	16.0	18.3	14.7	22.8	25.9	34.8	36.0	22.0	23.6	21.0	16.5	41.3	23.3	32 5
Prescott	18.8	20.0	21.3	13 3	28.9	23.0	39.1	28.8	23.3	18 0	25.0	13.3	60.1	29.3	32.2
Russell	18 6	15.4	22.1	12.5	30 4	25.0	39.5	35.0	20.0	20.0	24.7	17.5	55.0	22.5	25.0
Carleton	22.3	13.8	23.5	13.9	33.8	23.0	42.0	41.2	18.2	15.5	25.3	19.8	50 0	21.8	24.4
Renfrew	18 8	18.8	19.7	17.4	23.5	27.9	36.0	36.6	20.0	19.4	22.0	23.9	49.0	20.3	18.8
Lanark	17.6	21.2	20 0	12.8	30.4	27.8	38.3	34.9	14.6	21.5	21.7	25.4	62.1	22.6	17.3
Averages	18.0	17.5	20.4	14.8	23.9	23.0	37.9	34.6	16.9	18.3	22.7	20.3	59.4	23.0	25.4
Victoria	18.1	14.0	18.0	15.2	26.6	24.4	35.5	36.0	15.4	15.7	23.8	19.8	51.3	20.8	19.3
Peterborough	22.8	16.5	18.2	17.8	26.1	27.1	33.8	41.4	15.2	16.1	21.6	22.1	56.7	26.7	17.5
Haliburton	16.8	10.0	15.7	8.0	30.0	28.0	29.4	33.0	18.5	20.0	21.4	25.0	50.0	20.5	20.0
Hastings	20.6	19.0	16.6	18.8	24.2	24.6	31.6	35.0	14.4	15 0	19.1	18.0	53.0	19.8	21.4
Averages	20.6	16.1	17.7	16.7	25.3	25.0	33.3	36.8	14.7	15.3	21.4	20.1	53.0	21.0	19.7
Muskoka	17.0	14.3	16.1	14.9	22.5	22.3	32.3	32.4	18.0	19.8	22.0	18.7	39.0	28.6	22.3
Parry Sound	17.5	14.7	19.1	15.8	24.0	25.0	30.0	32.3	23.3	21.0	22.6	20.5	60.0	25 0	40.0
Algoma	27.5	18.6	16.7	17.0	27.0	24.0	39.2	40.0	27.5	16.7	28.3	24.2	50.0	30.0	25.0
Averages	21.5	18.0	17.1	16.4	24.4	24.1	33.0	34.2	21.4	20.1	24.5	21.6	44.4	27.8	27.2
HE Province	24.0	10.6	20.2	16.6	27.3	24.3	38.9	38.5	15 9	16.0	24 0	19.7	74.1	22.5	23 8

AVERAGE PRODUCTION.

TABLE No. XVI.—Showing by County Municipalities and groups of Counties the average production of Field Roots and Hay and Clover per acre in the years 1883 and 1884.

COUNTIES.	Potatoes. Bush.		Mangold Wurtzels Bush.		Carrots. Bush.		Turnips. Bush.		Hay and Clover. Tons.	
	1884.	1883.	1884.	1883	1884.	1883.	1884.	1883.	1884.	1883.
Essex	150 3	101	473.5	306	338.1	260	314.7	200	1.50	1 68
Kent	155.6	121	415.4	257	267.3	218	343.2	242	1.50	1.60
Elgin	157.7	75	405.4	172	345.0	115	407.5	110	1.57	1.59
Norfolk	135.5	101	520.7	450	294.6	450	353.5	400	1.63	1.56
Haldimand	136.6	111	405.3	244	333.2	117	394.4	290	1.62	1.40
Welland	140.7	111	380 8	350	250 8	158	277.5	309	1.72	1.60
Averages	151.9	103	418.9	285	295.9	220	349 8	276	1.61	1.56
Lambton	157.9	83	393.3	230	331.7	183	383.3	250	1.46	1.72
Huron	139 5	87	454.5	306	397.6	400	355.1	287	1.40	1.60
Bruce	136 7	127	345.0	420	288.3	367	316.6	369	1.17	1.55
Averages	124.0	101	433 2	360	358.6	359	339.3	321	1.34	1.61
Grey	132 2	103	545.2	444	420.0	456	430.6	406	1.20	1.58
Simcoe	136.6	108	433.8	318	423 4	370	440.7	328	1.50	1.76
Averages	144 9	105	505.6	381	409.5	413	433.3	386	1.32	1.65
Middlesex	179.7	75	465.4	334	337.7	273	410.6	292	1.63	1.81
Oxford	173.4	63	511.4	367	396.1	422	461.0	295	1.50	1.79
Brant	172.9	115	600 2	448	445.3	375	510.5	360	1.73	1.88
Perth	187 6	69	547.9	244	483.9	260	496.6	142	1.57	1.88
Wellington	148 3	100	515 9	371	402.8	285	457.4	276	1.51	2.01
Waterloo	176.1	95	453.3	400	350.0	444	395.8	261	1.91	1.93
Dufferin	156.0	151	393.3	330	290 0	306	421.4	297	1.34	1.95
Averages	167.2	90	509.1	331	309 5	343	454.1	251	1.59	1.89
Lincoln	146.9	75	333.2	340	261.0	325	293.1	300	1.50	1.20
Wentworth	155.9	109	503.3	525	407.1	433	466.8	406	1.70	1.93
Halton	154.7	100	456.7	360	367.9	460	425.0	387	1.61	1.81
Peel	168.3	90	543.7	200	481.7	242	499.9	242	1.42	2.11
York	173.6	65	516.7	464	457.1	492	472.4	273	1.57	1.75
Ontario	188.0	80	522.8	464	453.4	417	468.0	333	1.52	1.75
Durham	185.8	70	451.8	389	400 4	370	485.2	395	1.31	1.90
Northumberland	179.8	100	484.3	467	308.3	333	440.6	335	1.28	1.53
Prince Edward	125.6	105	290.0	166	158.9	195	197.8	112	1 16	1.67
Averages	168.4	87	485.9	412	410.4	373	463.7	342	1.46	1.74
Lennox and Addington	157 2	70	270.0	400	220.0	200	220.0	150	1.05	1.72
Frontenac	158.5	80	325.0	400	232.5	250	227.5	175	1.18	1.85
Leeds and Grenville	181.5	97	511.5	430	388 5	300	438.9	412	1.16	1.86
Dundas	230.0	106	340.0	412	412.5	300	266.7	350	1.31	1.97
Stormont	125.0	132	356.4	360	375.0	200	200.0	200	1.39	2.03
Glengarry	183.9	135	400.0	300	350.0	250	300.0	220	1.36	2.25
Prescott	208.3	112	300.0	300	289.3	350	391.7	233	1.35	2.00
Russell	150.0	75	424.2	309	395.3	250	368.3	250	1.13	1.90
Carleton	194.2	100	465.3	400	414.0	400	413 3	300	1.12	1.67
Renfrew	179.8	124	319.4	433	285.0	383	356.0	300	.92	1.81
Lanark	191.9	120	465.0	303	380.0	278	370.0	355	1.25	1 98
Averages	189.4	104	414.3	387	364.8	334	351.3	292	1.18	1.88
Victoria	189.4	102	482.4	383	383.8	370	423.9	260	1.01	1.71
Peterborough	169.9	108	430.7	318	356.3	338	398.7	380	.93	1.78
Haliburton	242.9	75	300.0	300	300.0	250	337.5	180	1.03	1.33
Hastings	133.2	111	318.0	250	281.1	250	275.3	200	1.47	1.67
Averages	159.8	106	423.3	338	354.2	334	390.5	270	1.19	1.69
Muskoka	160.6	117	250.0	338	326.3	228	314 8	257	.96	1.64
Parry Sound	172.5	133	358 2	200	400.0	175	290.6	283	1.15	1.33
Algoma	178.6	134	533.3	300	333.3	200	457.1	380	1.75	1.50
Averages	168.1	126	372.6	279	339.2	205	333.3	297	1.19	1.53
The Province	163.2	98	471.9	368	382 0	354	426.2	304	1.39	1.75

HORSES.

TABLE No. XVII.—Showing by County Municipalities and groups of Counties the number of Working Horses, Breeding Mares and Unbroken Horses in Ontario in the years 1883 and 1884.

COUNTIES.	Working Horses.		Breeding Mares.		Unbroken Horses.		Totals.	
	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
Essex	7,587	8,174	2,658	2,541	4,140	3,647	14,385	14,362
Kent	9,501	10,653	2,436	2,885	4,012	3,791	15,949	17,329
Elgin	7,368	8,523	2,234	2,141	3,664	3,240	13,266	13,904
Norfolk	6,608	7,506	1,832	1,897	3,100	2,707	11,540	12,110
Haldimand	5,785	6,004	1,831	1,486	3,225	2,297	10,841	9,787
Welland	4,850	5,364	1,093	1,078	2,192	1,990	8,135	8,432
Totals	41,699	46,224	12,084	12,028	20,333	17,672	74,116	75,924
Lambton	7,531	7,675	2,348	1,864	3,847	2,954	13,726	12,493
Huron	12,908	15,687	5,310	4,893	7,242	6,251	25,460	26,831
Bruce	9,766	11,850	2,971	2,940	4,491	4,310	17,228	19,100
Totals	30,205	35,212	10,629	9,697	15,580	13,515	56,414	58,424
Grey	12,623	14,967	3,889	3,618	5,246	4,707	21,758	23,292
Simcoe	11,860	13,989	3,998	3,711	5,700	4,885	21,558	22,585
Totals	24,483	28,956	7,887	7,329	10,946	9,592	43,316	45,877
Middlesex	13,574	15,478	4,553	4,361	6,939	5,810	25,066	25,649
Oxford	9,262	10,998	2,925	2,796	3,964	3,927	16,151	17,721
Brant	5,157	5,568	1,380	1,337	2,323	1,933	8,860	8,838
Perth	9,857	11,400	3,118	3,153	4,445	3,982	17,420	18,535
Wellington	11,109	12,924	3,398	3,193	4,844	4,731	19,351	20,848
Waterloo	6,839	7,836	2,079	1,811	2,824	2,530	11,742	12,177
Dufferin	4,379	5,041	1,397	1,076	1,958	1,729	7,734	7,846
Totals	60,177	69,245	18,850	17,727	27,297	24,642	106,324	111,914
Lincoln	4,920	5,504	1,336	1,202	2,253	1,933	8,509	8,639
Wentworth	6,768	7,614	1,880	1,643	2,913	2,441	11,561	11,698
Halton	4,933	5,303	1,350	1,155	1,869	1,485	8,152	7,943
Peel	6,471	7,131	1,864	1,827	2,648	2,298	10,983	11,256
York	12,151	14,374	4,562	4,044	5,711	5,203	22,424	23,621
Ontario	8,885	10,979	3,859	3,535	5,047	4,275	17,791	18,789
Durham	7,841	8,762	2,464	2,018	3,611	3,233	13,916	14,013
Northumberland	8,983	10 037	2,635	1,894	3,807	3,138	15,425	15,069
Prince Edward	5,681	6,475	1,437	1,399	2,106	2,043	9,224	9,917
Totals	66,633	76,179	21,387	18,717	29,965	26,049	117,985	120.945
Lennox and Addington	5,908	6,374	1,345	1,183	1,991	1,962	9,244	9,519
Frontenac	4,786	5,713	1,336	1,185	2,033	1,870	8,155	8,768
Leeds and Grenville	9,574	11,325	2,477	2,397	4,467	3,991	16,518	17,713
Dundas	3,769	4,738	1,228	1,086	1,979	1,887	6,976	7,711
Stormont	3,226	3,936	1,057	906	1,525	1,550	5,808	6,392
Glengarry	3,970	5,222	1,733	1,601	2,179	1,886	7,882	8,709
Prescott	3,096	4 081	1,309	1,416	1,806	1,631	6,211	7,128
Russell	2,230	3,040	941	1,022	1,233	1,340	4,404	5,402
Carleton	7,430	8,050	2,156	2,006	3,233	2,819	12,819	12,875
Renfrew	6,030	6,317	1,485	1,559	2,206	1,972	9,721	9,848
Lanark	5,327	6,231	1,449	1,401	2,375	2,171	9,151	9,803
Totals	55,346	65,027	16,516	15,762	25,027	23,079	96,889	103,868
Victoria	6,730	8,470	1,866	2,034	2,588	2,669	11,184	13.173
Peterborough	5,699	6,038	1,246	1,245	2,070	1,887	9,015	9,170
Haliburton	522	589	125	117	146	145	793	851
Hastings	9,905	11,208	2,665	2,056	3,850	3,305	16,420	16,569
Totals	22,856	26,305	5,902	5,452	8,654	8,006	37,412	39,763
Muskoka	1,053	1,079	308	278	364	287	1,725	1,644
Parry Sound	584	567	172	184	225	136	981	887
Algoma	438	758	175	206	178	223	791	1,187
Totals	2,075	2,404	655	668	767	646	3,497	3,718
The Province	303,474	349,552	93,910	87,380	138,569	123,201	535,953	560,133

Note.—The returns for 1884 are of the date 25th June, and those for 1883 of 15th June.—There is reason to believe that in many cases of last year's returns breeding mares were also included with working horses, and so were counted twice. This year the schedule was made more specific, with a view to prevent a recurrence of that error; hence, obviously, the smaller number of working horses in 1884 as compared with 1883.

CATTLE.

TABLE No. XVIII.—Showing by County Municipalities and groups of Counties the number of Oxen, Milch Cows, Store Cattle, and young and other Cattle in Ontario in the years 1883 and 1884.

COUNTIES.	Working Oxen.		Milch Cows.		Store Cattle over two years.		Young and Other Cattle.		Totals.	
	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
Essex	185	270	12,232	10,726	6,270	5,047	14,939	14,088	33,626	30,131
Kent	187	124	17,797	17,909	13,515	11,402	23,012	23,698	54,511	53,133
Elgin	384	223	15,624	15,563	12,218	10,879	20,197	21,173	48,423	47,838
Norfolk	642	352	14,249	13,765	5,249	4,191	14,585	15,244	34,725	33,552
Haldimand	128	101	11,346	10,353	5,256	4,433	14,391	12,886	31 121	27,773
Welland	204	232	7,830	7,828	2,818	2,801	8,758	8,570	19,610	19,431
Totals	1,730	1,302	79,078	76,144	45,326	38,753	95,882	95,659	222,016	211,858
Lambton	30	21	18,045	15,459	15,131	12,350	28,030	24,597	61,236	52,427
Huron	545	660	29,535	29,383	26,984	22,327	47,585	48,086	104,649	100,456
Bruce	1,118	1,114	23,896	24,283	17,479	15,191	38,377	37,904	80,870	78,492
Totals	1,693	1,795	71,476	69,125	59,594	49,868	113,992	110,587	246,755	231,375
Grey	2,773	2,794	31,040	29,823	24,449	18,883	47,500	46,062	105,762	97,562
Simcoe	658	785	22,778	22,017	15,997	12,796	31,269	30,413	70,702	66,011
Totals	3,431	3,579	53,818	51,840	40,446	31,679	78,769	76,475	176,464	163,573
Middlesex	148	124	32,841	30,890	34,625	28,456	46,254	44,521	113,868	103,991
Oxford	146	189	29,188	30,847	14,066	11,779	26,988	26,640	70,388	69,455
Brant	50	18	9,791	9,226	3,933	3,402	11,755	10,916	25,529	23,562
Perth	344	233	24,052	23,571	17,031	14,358	34,986	34,924	76,413	73,086
Wellington	481	599	24,153	22,520	17,078	14,628	36,388	34,040	78,100	71,787
Waterloo	205	145	12,973	12,325	6,378	5,237	17,104	16,447	36,655	34,154
Dufferin	371	394	9,112	8,456	7,083	5,759	14,366	13,377	30,932	27,986
Totals	1,745	1,702	142,110	137,835	100,189	83,619	187,841	180,865	431,885	404,021
Lincoln	228	163	7,518	8,014	3,031	2,624	8,542	8,496	19,319	19,297
Wentworth	244	279	12,453	12,226	5,097	4,124	13,568	12,565	31,362	29,194
Halton	267	264	8,854	8,065	7,148	5,359	10,801	10,341	27,070	24,029
Peel		51	10,746	9,841	6,659	5,374	12,946	11,194	30,351	26,460
York	135	185	19,205	18,949	8,895	7,551	19,190	18,476	47,425	45,161
Ontario	128	116	16,654	15,614	11,443	9,095	23,286	22,322	50,911	47,147
Durham	136	114	12,571	11,907	6,793	6,004	17,764	15,850	37,264	33,965
Northumberland	200	405	18,923	17,625	6,130	5,746	17,385	16,095	42,638	39,871
Prince Edward	45	27	8,911	8,503	1,689	1,696	6,690	6,024	17,335	16,250
Totals	1,383	1,604	115,235	110,834	56,885	47,573	130,172	121,363	303,675	281,374
Lennox and Addington	531	508	12,465	11,949	5 368	3,792	10,892	9,470	29,256	25,719
Frontenac	648	492	13,501	14,135	5,079	4,313	11,949	11,669	31,177	30,609
Leeds and Grenville	162	185	40,950	38,754	7,703	8,896	25,865	22,932	74,680	70,767
Dundas	11	42	15,131	14,752	2,568	2,453	8,802	8,948	26,512	26,195
Stormont	121		12,940	13,219	2,740	2,024	7,041	7,866	22,842	23,109
Glengarry		10	17,481	17,379	3,024	2,320	10,407	9,941	30,912	29,650
Prescott	35	93	10,661	9,818	3,000	2,284	7,123	7,161	20,819	19,356
Russell	28	28	6,826	7,165	2,621	2,205	6,152	6,948	15,627	16,346
Carleton	119	21	19,865	18,891	8,251	7,114	16,898	17,391	45,133	43,417
Renfrew	245	331	15,779	16,432	8,578	7,394	17,866	20,183	42,468	44,340
Lanark	98	87	17,902	16,620	8,135	6,759	18,654	17,867	44,789	41,333
Totals	1,998	1,797	183,501	179,114	57,067	49,554	141,649	140,376	384,215	370,841
Victoria	194	257	12,374	12,491	8,290	5,503	16,156	16,192	37,014	34,443
Peterborough	404	493	12,720	11,929	5,769	5,367	13,842	13,270	32,735	31,059
Haliburton	430	406	1,980	1,815	1,027	715	2,809	2,774	6,246	5,710
Hastings	1,157	1,704	30,711	32,115	5,828	5,654	21,356	20,422	59,052	59,895
Totals	2,185	2,860	57,785	58,350	20,914	17,239	54,163	52,658	135,047	131,107
Muskoka	1,075	922	4,035	3,393	2,281	1,590	6,046	5,111	13,437	11,016
Parry Sound	837	837	1,884	1,978	959	855	2,755	3,078	6,435	6,748
Algoma	716	673	1,597	1,824	792	741	2,636	2,903	5,741	6,141
Totals	2,628	2,432	7,516	7,195	4,032	3,186	11,437	11,092	25,613	23,905
The Province	16,793	17,071	710,519	690,437	384,453	321,471	813,905	789,075	1,925,670	1,818,054

Note.—The returns for 1884 are of the date 25th June, and those of 1883 of 15th June.

SHEEP.

TABLE No. XIX.—Showing by County Municipalities and groups of Counties the number of Coarse and Fine Woolled Sheep in Ontario in the years 1883 and 1884.

COUNTIES.	Coarse Woolled.				Fine Woolled.				Totals.	
	Over 1 year.		Under 1 year.		Over 1 year.		Under 1 year.			
	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
Essex	13,643	13,046	7,351	6,841	1,708	1,778	1,372	922	24,074	22,587
Kent	18,797	22,619	10,612	12,076	4,675	3,755	3,314	2,425	37,428	40,875
Elgin	24,858	26,368	13,725	14,047	5,016	5,667	3,194	1,875	46,753	44,957
Norfolk	16,168	18,040	9,267	9,877	4,414	3,796	3,148	2,684	32,997	34,397
Haldimand	13,956	15,425	12,058	11,588	3,788	2,954	2,563	2,060	38,545	34,027
Welland	11,239	12,011	6,799	6,815	4,679	2,946	3,018	2,003	25,735	23,769
Totals	104,201	111,509	60,442	61,014	24,280	17,890	16,609	11,969	205,532	202,382
Lambton	29,744	27,841	18,183	17,175	4,661	2,916	2,874	1,819	55,462	49,751
Huron	53,181	56,431	34,996	34,868	4,986	3,896	4,193	3,005	97,356	98,200
Bruce	45,987	47,561	29,210	29,071	5,980	5,893	4,999	4,013	86,176	86,538
Totals	128,912	131,833	82,389	81,114	15,627	12,705	12,066	8,837	238,994	234,489
Grey	72,023	68,840	45,291	39,695	7,290	7,848	6,171	4,868	130,775	119,132
Simcoe	42,378	42,263	25,793	21,930	7,893	5,850	6,445	3,715	82,709	73,758
Totals	114,601	109,073	71,084	61,536	15,183	13,698	12,616	8,583	213,484	192,890
Middlesex	41,419	47,189	23,401	26,446	4,671	4,526	2,703	3,402	72,194	81,563
Oxford	19,866	25,699	13,157	13,961	4,138	2,585	3,172	2,216	40,333	44,461
Brant	13,623	15,674	8,511	9,741	3,009	2,562	2,218	1,470	27,352	29,447
Perth	34,054	37,250	23,410	25,850	3,242	4,355	2,893	2,776	63,599	68,271
Wellington	45,080	49,285	30,242	28,663	8,448	5,973	7,145	4,446	94,515	88,367
Waterloo	20,637	22,602	12,252	12,828	4,427	3,992	3,285	2,782	40,601	42,204
Dufferin	18,929	17,111	12,276	9,921	2,123	2,198	1,876	1,296	35,204	30,526
Totals	197,208	214,810	123,249	125,450	30,049	26,191	23,292	18,388	373,798	384,839
Lincoln	8,130	10,702	4,978	6,186	3,519	2,046	2,677	1,339	19,304	20,273
Wentworth	14,000	16,854	8,787	9,279	3,407	2,432	2,411	1,870	28,605	30,435
Halton	12,164	13,989	6,576	7,021	2,089	1,236	1,966	915	22,795	21,470
Peel	16,621	16,667	9,788	9,372	1,575	1,106	1,428	956	29,412	27,937
York	28,870	28,845	12,871	16,177	6,902	3,929	5,795	3,121	49,438	52,071
Ontario	24,793	26,752	14,450	14,423	6,411	5,197	4,740	3,594	50,394	49,966
Durham	23,684	22,044	12,579	12,068	2,277	1,807	1,619	1,029	40,159	36,948
Northumberland	21,789	21,315	14,042	10,540	2,389	2,634	1,531	1,728	39,788	36,217
Prince Edward	8,349	9,464	5,400	5,171	2,458	3,083	1,437	2,009	17,688	19,727
Totals	153,390	164,746	89,471	90,236	31,018	23,461	23,604	16,561	297,483	295,004
Lennox and Addington	13,548	15,713	8,385	8,296	3,523	3,588	2,276	1,980	27,732	29,577
Frontenac	16,504	20,137	11,528	11,071	3,245	3,328	1,774	1,693	33,051	36,229
Leeds and Grenville	37,684	40,466	21,694	22,515	10,501	8,395	5,802	5,122	75,681	76,498
Dundas	10,089	13,468	6,345	7,410	2,524	2,815	1,733	1,546	20,691	25,239
Stormont	8,056	9,670	3,291	4,332	2,855	3,066	1,299	1,458	15,501	18,526
Glengarry	13,553	15,501	5,915	6,724	3,912	3,886	1,737	1,859	25,117	27,970
Prescott	10,246	10,173	5,288	5,709	3,462	2,575	2,043	1,589	21,039	20,046
Russell	9,405	8,940	3,861	4,324	1,555	2,012	834	863	15,655	15,939
Carleton	29,658	29,872	18,891	15,593	4,418	4,943	3,051	2,752	56,018	53,160
Renfrew	37,722	34,687	23,235	16,957	4,484	5,342	2,386	2,494	67,827	59,480
Lanark	34,987	37,461	22,065	19,760	4,070	2,534	2,038	1,718	63,160	61,473
Totals	221,452	235,788	130,498	122,691	44,549	42,484	24,973	23,054	421,472	424,017
Victoria	22,727	21,630	13,138	10,301	2,665	3,020	1,783	1,645	40,313	36,596
Peterborough	18,176	18,909	8,826	9,456	3,106	1,460	2,270	740	32,378	30,565
Haliburton	2,325	2,607	1,182	963	980	730	1,149	530	5,636	4,830
Hastings	23,495	24,274	10,651	12,682	5,938	6,722	3,691	3,763	43,775	47,441
Totals	66,723	67,420	33,797	33,402	12,689	11,932	8,893	678	122,102	119,432
Muskoka	4,825	4,536	3,054	2,760	1,593	991	1,028	673	10,500	8,960
Parry Sound	1,677	1,220	965	702	516	424	399	313	3,557	2,659
Algoma	1,619	2,145	1,047	1,190	837	505	308	272	3,811	4,112
Totals	8,121	7,901	5,066	4,652	2,946	1,920	1,735	1,258	17,868	15,731
The Province	994,608	1,043,080	595,996	580,095	176,341	150,281	123,788	95,328	1,890,733	1,868,784

Note.—The returns for 1884 are of the date 25th June and those for 1883 of 15th June.

PIGS AND POULTRY.

TABLE XX.—Showing by County Municipalities and groups of Counties the number of Pigs and Poultry in Ontario in the years 1883 and 1884.

COUNTIES.	Pigs.				Poultry.					
	Over One Year.		Under One Year.		Turkeys.		Geese.		Other Fowls.	
	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
Essex	14,094	11,523	28,975	31,805	8,373	7,608	15,494	14,198	138,028	136,489
Kent	11,279	10,784	29,408	33,701	11,538	11,769	12,998	16,612	144,326	150,350
Elgin	6,856	7,390	19,953	25,362	8,946	7,368	8,116	9,665	120,482	123,670
Norfolk	4,697	5,057	19,154	19,347	6,475	5,069	8,436	7,967	122,862	120,429
Haldimand	3,933	3,205	13,803	13,448	10,597	6,213	8,936	7,043	95,361	81,612
Welland	2,631	2,231	8,638	9,267	10,986	5,993	6,000	5,156	87,043	77,588
Totals	43,520	40,190	119,931	132,930	56,915	44 020	59,980	60,641	708,082	696,138
Lambton	5,199	4,242	15,052	14,306	9,387	6,860	12,695	9,791	127,493	106,891
Huron	10,521	9,409	26,630	24,855	13,169	10,035	30,171	23,703	264,505	255,406
Bruce	9,466	7,844	20,653	21,168	7,649	7,286	20,681	20,470	185,383	176,257
Totals	25,186	21,495	62,335	60,329	30,205	24,181	63,547	53,964	577,381	538,554
Grey	13,476	12,035	31,118	28,244	15,218	12,455	28,532	25,964	226,159	212,322
Simcoe	15,423	11,974	31,694	30,579	17,943	13,353	30,419	25,808	207,273	186,071
Totals	28,899	24,009	62,812	58,823	33,161	25,808	58,951	51,772	433,432	398,393
Middlesex	10,020	9,343	29,375	33,508	19,400	17,342	19,802	20,420	238,074	232,142
Oxford	7,157	5,696	19,964	25,624	10,902	10,315	9,817	9,763	148,930	156,024
Brant	3,062	2,414	12,884	11,516	6,006	4,978	5,754	4,836	78,494	72,462
Perth	7,430	7,022	17,771	18,487	7,236	7,524	23,517	21,687	209,804	184,269
Wellington	7,216	7,697	28,316	24,818	14,964	11,418	22,880	20,663	192,036	182,817
Waterloo	3,711	3,532	14,970	12,700	4,221	3,024	5,979	5,635	110,484	106,292
Dufferin	4,158	3,809	12,721	10,794	7,561	6,029	14,328	10,736	82,673	68,709
Totals	42,754	39,513	136,001	137,537	70,290	60,630	102,077	93,690	1,060,491	1,002,655
Lincoln	2,555	2,030	10,295	10,998	6,897	4,972	4,691	4,098	70,707	71,379
Wentworth	2,808	3,145	15 580	16,384	8,238	7,516	8,590	7,521	89,062	93,844
Halton	2,480	2,213	10,231	9,102	5,955	7,226	9,485	7,721	72,807	63,381
Peel	5,101	4,106	15,355	14,901	21,492	13,022	18,875	13,473	114,056	97,462
York	6,683	6,657	31,319	29,199	17,697	13,829	18,908	19,178	177,158	170,274
Ontario	6,963	7,194	19,668	19,840	12,463	9 566	17,014	14,127	151,563	139,781
Durham	5,858	5,762	17 258	13,051	16,216	11,746	17,574	15,629	115,808	108,454
Northumberland	5,815	6,182	15,177	14,195	11,790	9 867	11,246	11,962	139,905	124,494
Prince Edward	2,158	1,994	6,214	5,725	2,776	2,279	4,233	5,966	88,973	83,305
Totals	40,421	39,343	141,097	133,395	103,524	80,023	110,616	99,675	1,020,039	952 374
Lennox and Addington	2,790	2,731	7,389	6,745	2,697	2,629	6,484	5,903	81,667	76,316
Frontenac	2,887	3,245	6,509	6,623	9,016	6,273	8,647	6,404	75,035	67,624
Leeds and Grenville	9,438	9,809	13,647	15,451	33,015	27,085	19,323	17,151	185,061	178,400
Dundas	3,885	4,316	6,447	7,644	4,898	3,758	5,919	5,668	102.212	103,826
Stormont	2,948	3,426	4,881	5,381	3,831	2,715	4,546	4,307	70,529	79,001
Glengarry	3,352	4,321	5.793	5,815	2,539	2,352	6.489	5,568	78,186	74,374
Prescott	3,527	4,919	5,415	5,659	4,137	4,352	3,478	3,410	54,458	56,227
Russell	3,368	3,043	4,647	4,388	5,945	3,372	3,104	2,491	43,535	47,006
Carleton	7,037	7.201	15,034	13,413	23,616	17,503	17,724	15,306	154,554	130,846
Renfrew	7.548	8,408	9,406	9,040	13,182	10,552	11,736	11,001	80,887	87,085
Lanark	5,609	5,407	8,608	9,370	21,962	15,406	13,009	10,606	114,793	108,843
Totals	52,389	56,826	87,776	89,629	124,838	95,997	100,459	87,810	1,040 917	1.009,548
Victoria	5,892	5,863	13,152	13,552	10,587	7,626	13,956	13,210	103,302	91.409
Peterborough	6,036	5,231	11,223	9,917	7,729	5,658	13,051	10,145	97,429	89,345
Haliburton	622	702	1,094	1,250	309	352	796	771	11,642	11,203
Hastings	8.509	9,798	14,313	15,923	3,262	8,219	12,776	16,171	138,424	158,387
Totals	21,059	21,594	39.784	40.642	21,887	21,855	40,579	40,297	350,797	350.344
Muskoka	1,206	889	3,030	2,526	1,903	990	1,603	1,168	28,738	21,402
Parry Sound	974	880	2,531	2,300	1,980	1,065	836	717	16,554	16.061
Algoma	1,303	1,257	3,150	2,620	829	1,066	1,482	1,363	15.513	15,147
Totals	3,483	3,026	8,711	7,446	4,712	3 121	3,921	3,244	60,805	52,610
The Province	257,711	245.996	658,447	660,731	445,532	355,635	540,130	491,093	5,251,944	5,000,616

Note.—The returns for 1884 are of the date 25th June, and those for 1883 of 15th June.

WOOL.

TABLE No. XXI.—Showing by County Municipalities and groups of Counties the clip of Coarse and Fine Wools in Ontario in the years 1883 and 1884.

COUNTIES.	Coarse Wool.				Fine Wool.				Total Clip.	
	1884.		1883.		1884.		1883.		Pounds.	
	Fleeces.	Pounds.	Fleeces.	Pounds.	Fleeces.	Pounds.	Fleeces.	Pounds.	1884.	1883.
Essex	13,990	78,458	12,814	70,741	1,816	9,093	1,691	8,517	87,551	79,258
Kent	19,012	104,269	22,527	131,720	4,760	23,265	3,519	17,739	127,534	149,459
Elgin	25,022	135,730	25,831	148,137	5,245	35,004	2,670	14,017	170,734	162,154
Norfolk	16,310	88,558	18,045	98,599	4,510	20,448	3,968	19,400	109,006	117,999
Haldimand	19,792	123,841	19,370	114,419	4,454	21,496	2,889	14,559	145,337	128,978
Welland	11,447	61,972	12,362	64,649	4,904	22,226	3,032	13,736	84,198	78,385
Totals	105,573	592,828	110,949	628,265	25,689	131,532	17,769	87,968	724,360	716,233
Lambton	30,871	176,381	28,865	168,056	4,757	24,843	2,928	15,919	201,224	183,975
Huron	54,013	307,392	56,846	325,648	5,092	27,420	3,808	21,211	334,812	346,859
Bruce	47,192	271,209	48,243	276,866	6,164	34,506	6,006	33,072	305,715	309,938
Totals	132,076	754,982	133,954	770,570	16,013	86,769	12,742	70,202	841,751	840,772
Grey	74,360	405,969	68,423	371,533	7,606	39,866	7,969	42,240	445,835	413,773
Simcoe	43,776	251,748	42,670	238,927	7,928	40,750	5,786	30,392	292,498	269,319
Totals	118,136	657,717	111,093	610,460	15,534	80,616	13,755	72,632	738,333	683,092
Middlesex	42,046	241,842	48,547	286,878	4,637	25,633	4,812	26,681	267,475	313,559
Oxford	21,145	120,168	26,274	153,095	4,230	22,771	2,590	13,484	142,939	166,579
Brant	14,024	81,626	16,208	94,781	3,035	16,537	2,678	15,648	98,163	110,429
Perth	34,251	197,512	37,307	208,261	3,342	17,810	4,283	24,457	215,322	232,718
Wellington	49,911	294,897	50,479	296,237	8,726	44,310	6,085	32,277	339,207	328,514
Waterloo	22,034	124,172	22,394	123,601	4,444	20,588	3,737	17,481	144,760	141,082
Dufferin	19,161	110,035	17,567	100,791	2,207	12,120	2,127	11,491	122,155	112,282
Totals	202,572	1,170,252	218,776	1,263,644	30,621	159,769	26,312	141,519	1,330,021	1,405,163
Lincoln	8,172	43,326	10,837	55,967	3,704	17,930	2,074	9,748	61,256	65,715
Wentworth	14,290	84,302	17,263	97,522	3,551	17,575	2,458	11,805	101,877	109,327
Halton	12,281	80,157	12,891	80,646	1,999	11,402	1,301	7,054	91,559	87,700
Peel	16,392	112,100	16,941	109,541	1,405	7,966	1,085	5,949	120,066	115 490
York	24,058	150,257	28,896	182,782	6,221	32 111	3,987	20,748	182,368	203,530
Ontario	25,536	168,439	27,920	175.916	6.765	36,858	5,153	28,067	205,297	203,983
Durham	23,864	146,769	22,322	127,774	2,533	14,992	1,678	8,926	161,761	136,700
Northumberland	21,758	127,438	21,273	119,651	2,299	13,174	2.673	14,514	140,612	134,165
Prince Edward	8,577	44,921	9,571	48,771	2,547	12,919	3,116	15,713	57,840	64,484
Totals	154,928	957,709	167,914	998,570	31,024	164,927	23,525	122,524	1,122,636	1,121,094
Lennox and Addington	13,619	73,915	15,985	78,029	3,533	19,070	3,817	18,799	92,935	96,828
Frontenac	16,973	82,476	21,735	103,779	3,296	17,128	3,419	15,784	99,604	119,563
Leeds and Grenville	36,624	175,590	41,016	197,713	10 354	50,968	9,146	43,273	226,558	240,986
Dundas	10,411	50,675	13,663	68,550	2,626	11,827	2,777	14,116	62,502	82,666
Stormont	8,067	40,606	9,998	49,807	2,296	13,161	3,142	15,138	53,767	64,945
Glengarry	13,433	62,029	15,995	73,165	3,694	17,483	4,134	19,645	79,512	92,810
Prescott	8,318	39,575	10,058	45,619	3,306	15,288	2,676	13,100	54,863	58,719
Russell	7,683	35,828	9,106	42,802	1,370	6,263	2,158	9,622	42,091	52,424
Carleton	30,585	155,674	30,880	149,890	4,720	23,821	4,969	24,637	179,495	174,527
Renfrew	38,641	170,112	35,525	159,713	4,547	21,017	5,507	25,064	191,129	184,777
Lanark	35,125	171,473	39,153	184,092	4,081	19,107	2,587	12,226	190,580	196,318
Totals	219,479	1,057,953	243,114	1,153,159	43,823	215,133	44,332	211,404	1,273,086	1,364,563
Victoria	23,588	130,305	22,135	124,168	2,390	15,078	3,248	18,567	145,383	142,735
Peterborough	18,417	97,576	19,117	100,938	3,066	15,104	1,530	7,486	112,680	108,474
Haliburton	2,284	10,934	2,689	12,790	2,102	7,770	756	3,009	18,704	15,799
Hastings	23,207	117,481	25,629	120,851	6,397	29,392	6,927	33,391	146,873	154,242
Totals	67,496	356,296	69,570	358,797	13,955	67,344	12,461	62,453	423,640	421,250
Muskoka	5,114	27,410	4,609	26,425	1,678	8,337	958	4,781	35,747	31,206
Parry Sound	1,693	10,489	1,270	7,911	607	3,361	446	2,409	13,850	10,320
Algoma	1,879	12,007	2,084	11,862	826	3,487	473	2,863	15,494	14,725
Totals	8,686	49,906	7,963	46,198	3,111	15,185	1,877	10,053	65,091	56,251
The Province	1,008,946	5,597,643	1,063,333	5,829,663	179,770	921,275	152,773	778,755	6,518,918	6,608,418

RENT AND WAGES.

TABLE No. XXII.—Showing by County Municipalities and for groups of Counties and the Province the average Rent of Farm Land, per Acre, and the average Wages of Farm Hands and Domestic Servants in the years 1883 and 1884.

COUNTIES.	Leased Farms.		Wages of Farm Hands and Domestics.									
			Farm Hands.								Domestics.	
	Rent per Acre.		Per Year with Board.		Per Year without Board.		Per Month with Board.		Per Month without Board.		Per Week with Board.	
	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
Essex	$2 88	$2 75	$157	$167	$260	$265	$18 03	$20 36	$27 68	$30 61	$1 65	$1 63
Kent	3 33	3 53	176	185	272	275	19 57	20 71	28 91	30 08	1 53	1 57
Elgin	3 12	3 07	175	185	255	264	20 62	20 76	29 47	29 93	1 54	1 53
Norfolk	2 64	2 62	158	162	245	234	18 07	18 00	26 57	24 96	1 41	1 35
Haldimand	2 42	2 70	157	179	242	269	18 25	20 86	28 26	29 49	1 43	1 59
Welland	2 63	2 54	148	152	243	241	17 71	18 11	27 69	28 24	1 46	1 42
Averages	2 84	2 92	162	174	253	260	18 83	29 01	28 13	29 13	1 50	1 52
Lambton	2 66	2 76	176	188	271	289	19 86	21 86	29 91	32 69	1 55	1 61
Huron	2 89	2 85	167	174	253	274	19 53	20 94	29 99	30 52	1 48	1 49
Bruce	2 54	2 48	166	172	252	270	19 94	20 60	29 00	29 81	1 47	1 47
Averages	2 74	2 70	169	176	257	276	19 73	21 05	29 72	30 85	1 49	1 51
Grey	1 99	2 01	164	166	255	254	19 24	19 89	30 06	29 57	1 45	1 38
Simcoe	2 65	2 66	166	171	264	273	20 10	20 82	29 78	30 72	1 50	1 56
Averages	2 26	2 25	165	168	260	262	19 66	20 30	29 92	30 08	1 47	1 45
Middlesex	3 27	3 24	170	182	253	269	20 73	22 95	30 80	31 95	1 55	1 58
Oxford	3 13	3 20	169	177	260	267	19 17	17 85	28 20	29 09	1 55	1 61
Brant	3 30	3 37	165	168	244	255	17 57	19 90	25 70	27 84	1 51	1 54
Perth	2 97	2 91	170	174	262	262	19 63	20 42	28 79	31 97	1 54	1 55
Wellington	2 49	2 42	171	171	264	269	19 43	19 15	29 11	29 48	1 55	1 55
Waterloo	2 88	2 92	158	159	247	250	19 65	18 29	27 64	28 55	1 45	1 37
Dufferin	2 21	2 23	167	164	269	260	19 64	19 25	29 33	29 05	1 47	1 47
Averages	2 90	2 91	167	173	256	263	19 58	19 94	28 94	30 10	1 52	1 53
Lincoln	2 99	2 89	162	164	252	253	18 98	19 10	28 35	28 28	1 37	1 38
Wentworth	3 29	3 50	164	166	257	258	18 66	19 36	28 52	30 21	1 49	1 56
Halton	2 77	2 84	168	179	256	280	19 71	19 96	29 82	30 15	1 59	1 73
Peel	3 19	3 16	172	174	262	268	19 56	19 65	28 88	29 39	1 73	1 74
York	3 53	3 74	179	175	268	269	19 56	20 00	30 47	30 86	1 63	1 60
Ontario	3 54	3 43	168	181	260	271	18 61	20 83	28 86	29 63	1 51	1 54
Durham	3 55	3 51	167	173	241	262	18 69	19 13	29 56	29 63	1 53	1 56
Northumberland	3 17	2 81	158	168	239	263	17 78	20 02	27 26	30 20	1 48	1 50
Prince Edward	2 99	3 08	158	161	233	237	18 09	18 58	25 42	27 37	1 45	1 41
Averages	3 29	3 31	168	173	256	262	18 95	19 78	28 65	29 67	1 52	1 56
Lennox and Addington	2 30	2 40	165	157	242	237	18 67	19 66	28 07	29 17	1 40	1 47
Frontenac	1 85	1 83	162	161	262	253	18 61	21 36	27 92	31 61	1 41	1 45
Leeds and Grenville	1 91	1 96	172	167	259	258	21 15	20 78	29 76	29 74	1 57	1 48
Dundas	2 56	2 72	162	169	231	235	19 17	19 69	30 76	27 74	1 73	1 63
Stormont	2 08	2 17	172	171	247	246	19 27	20 52	29 24	30 00	1 62	1 53
Glengarry	2 21	2 12	158	169	257	253	20 53	19 75	28 36	31 85	1 65	1 55
Prescott	2 50	2 20	168	175	252	265	20 34	22 05	30 32	30 18	1 29	1 38
Russell	2 23	2 53	173	175	274	263	22 43	21 68	32 15	31 05	1 36	1 41
Carleton	2 65	2 79	170	175	252	259	19 57	20 16	29 33	30 30	1 63	1 63
Renfrew	1 80	1 58	183	188	273	278	19 51	21 22	28 38	31 05	1 37	1 41
Lanark	1 47	1 40	189	182	294	277	20 40	22 04	30 04	31 52	1 76	1 65
Averages	2 13	2 13	170	172	258	257	19 99	20 85	29 35	30 38	1 53	1 50
Victoria	2 85	2 63	174	178	257	274	18 98	20 60	28 71	31 11	1 49	1 53
Peterborough	2 03	2 05	171	174	258	265	19 74	20 98	30 33	31 90	1 68	1 60
Haliburton	1 17	1 28	164	182	271	278	19 80	21 83	30 31	31 60	1 27	1 50
Hastings	2 23	2 22	169	171	248	265	17 93	20 13	27 50	30 17	1 52	1 46
Averages	2 32	2 28	171	175	256	268	19 03	20 63	29 10	30 97	1 53	1 50
Muskoka	0 98	1 88	174	187	274	287	19 72	22 47	29 62	33 59	1 37	1 38
Parry Sound	1 02	1 57	178	206	218	301	20 68	22 01	31 41	33 46	1 39	1 40
Algoma	1 86	1 97	196	206	303	331	23 75	25 61	32 87	36 01	1 73	1 52
Averages	1 48	1 83	182	198	287	309	21 21	23 33	31 19	34 54	1 49	1 44
The Province	2 75	2 75	167	173	257	264	19 44	20 37	29 11	30 21	1 51	1 52

LABOUR AND WAGES.

TABLE XXIII.—Showing by industries the total wages paid to male and female employees for the two weeks ending April 26 and October 25, 1884, as given by 416 employers of labour in Toronto, Guelph, Stratford, London, Chatham, St. Thomas, Brantford, Galt, Dundas, Hamilton, St. Catharines, Merritton, Thorold, Oshawa, Belleville, Kingston, Brockville, Cornwall, Ottawa and Almonte.

TITLE OF INDUSTRY.	No. of Returns.	Week ending April 26.					Week ending October 25.				
		Sex.		Number.		Amount of Wages or Earnings.	Sex.		Number.		Amount of Wages or Earnings.
		Male.	Female.	Over 16.	Under 16.		Male.	Female.	Over 16.	Under 16.	
						$ c.					$ c.
Agricultural implement factories	17	1,400	.....	1,303	97	11,992 81	1,141	.....	1,050	91	10,199 95
Agricultural hand implement factories	2	157	.....	157	.....	1,658 36	158	.....	158	.....	1,493 08
Axe factories	3	70	.....	70	....	779 71	73	.....	73	.....	782 88
Axle factories	2	26	.....	26	.....	190 00	20	.....	20	.....	165 35
Biscuit factories	7	258	153	347	64	2,680 64	299	176	411	64	2,906 83
Boiler and engine factories	16	950	.....	929	21	8,197 88	916	.....	896	20	8,055 34
Boot and shoe factories, wholesale.	4	230	97	309	18	2,288 22	241	106	327	20	2,542 99
" " retail	4	15	1	16	....	121 00	16	1	17	.....	139 00
Bookbinders	3	84	54	103	35	851 60	94	63	129	28	984 75
Bridge makers	2	142	.....	134	8	1,247 39	257	.....	246	11	2,194 32
Brass foundries	2	16	.....	16	.....	115 50	17	.....	17	.....	110 50
Breweries and distilleries	13	546	2	521	27	4,997 22	467	2	443	26	4,441 66
Butchers	7	67	2	58	11	580 84	95	2	80	17	715 95
Builders	4	210	.....	210	.....	2,253 47	214	.....	214	.....	2,497 62
Carriage makers	20	361	.....	310	51	3,067 82	343	.....	297	46	2,518 37
Carriage furnishings	2	69	1	70	.....	729 55	75	1	73	3	832 66
Canning factories	2	15	12	18	9	193 00	28	244	237	35	1,099 20
Cigar and tobacco factories	10	309	186	289	206	2,800 56	307	170	263	214	2,774 27
Coal merchants	5	154	....	147	7	1,032 75	229	.....	222	7	1,466 90
Clothing factories	15	134	381	487	28	2,776 98	115	376	463	28	2,561 35
Cotton factories	5	735	767	1,304	198	8,548 97	678	716	1,205	189	7,956 53
Cotton batting factories	2	10	11	19	2	97 60	10	11	19	2	94 60
Cooper shops	3	31	.....	30	1	316 00	25	.....	25	.....	250 00
Fanning mills works	2	21	.....	21	.....	179 50	6	.....	6	.....	54 00
Flouring mills	18	381	.....	376	5	3,332 38	389	.....	384	5	3,413 64
Foundries (general)	11	227	.....	210	17	1,958 41	199	.....	186	13	1,705 99
Furniture and cabinet works	16	601	5	552	54	5,231 65	613	6	562	57	5,243 35
Gas works	4	167	.....	166	1	1,524 83	195	.....	193	2	1,833 73
Glass factories	2	307	8	166	149	3,395 65	276	8	153	131	2,931 85
Harness makers	8	57	.....	57	.....	525 00	51	.....	51	.....	466 50
Hat factories	5	54	51	105	.....	792 23	58	71	127	2	762 86
Hotels	10	111	143	248	6	972 50	111	143	248	6	972 50
Hub, spoke and bending factories	4	156	.....	132	24	1,279 14	146	.....	128	18	1,154 13
Jewellers and watchmakers	11	165	28	167	26	1,448 15	172	26	176	22	1,480 96
Lead and paint makers	2	20	.....	18	2	142 00	16	.....	16	.....	128 00
Lumber mills	5	1,586	.....	1,536	50	11 419 53	1,577	.....	1,527	50	11,404 72
Malleable iron works	2	199	.....	164	35	1,979 50	182	.....	151	31	1,723 25
Marble works	11	94	.....	91	3	958 38	85	.....	82	3	832 24
Miscellaneous	30	2,208	135	2,226	117	20,617 11	2,022	141	2,029	134	19,348 06
Newspaper publishers	31	983	18	735	266	8,242 00	978	17	710	285	7,972 08
Oatmeal mills	3	25	.....	23	.....	191 50	24	.....	24	.....	199 50
Painters and glaziers	2	41	.....	39	2	407 50	47	.....	46	1	453 50
Paper mills	2	72	61	133	.....	897 96	74	63	137	.....	912 96
Planing mills	17	371	.....	347	24	3,369 51	398	.....	369	29	3,530 79
Plumbers and gasfitters	3	26	.....	17	9	217 00	25	.....	17	8	208 50
Piano and organ factories	5	228	.....	214	14	2,342 00	236	.....	219	17	2,437 50
Safe makers	2	138	.....	124	14	1,253 65	151	.....	128	23	1,444 61
Scale makers	2	64	.....	63	1	634 00	70	.....	69	1	689 60
Sewing machine factories	4	491	.....	456	35	4,811 22	456	.....	429	27	4,347 46
Ship builders	2	90	.....	90	.....	792 00	29	.....	29	.....	259 50
Soap makers	3	56	3	39	20	399 60	56	3	39	20	399 60
Stove foundries	12	1,093	19	1,092	20	10,193 20	1,110	21	1 102	29	10,278 89
Tanneries	9	145	.....	142	3	1,152 60	190	.....	182	8	1,503 18
Tin shops	5	94	7	80	21	670 70	88	7	79	16	659 20
Woollen factories	12	346	423	638	131	4,249 45	335	415	624	126	4,122 63
Wool knitting mills	9	144	231	295	80	1,490 70	143	238	294	87	1,597 36
Wire works	2	55	.....	31	24	299 01	58	.....	34	24	317 05
Totals	416	16,803	2,799	17,666	1,936	154,867 43	16,384	3,027	17,435	1,976	151,603 79

NOTE.—In the return for lumber mills the bushmen are not given; only those employed in the mills, lumber yards, etc. In hotel returns board is included in all cases. Miscellaneous returns include all industries for which only one return has been received.

LABOUR AND WAGES.

TABLE No. XXIV.—Showing by occupations the average wages for the weeks ending April 26th and October 25th, 1884, with average of hours employed and of earnings for the two weeks, in Toronto, Guelph, Stratford, London, Chatham, St. Thomas, Brantford, Galt, Dundas, Hamilton, St. Catharines, Merritton, Thorold, Oshawa, Belleville, Kingston, Brockville, Cornwall, Ottawa and Almonte, based on returns of 19,602 workpeople collected from employers, and of 2,831 collected from the employees.

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople—		Wages for week ending April 26.	Wages for week ending Oct. 25.	Average per week for the two weeks of—	
	Over 16.	Under 16.			Hours employed.	Earnings.
			$ c.	$ c.		$ c.
Agricultural Hand Implement Workers:						
Blacksmiths	M	.....	13 12	12 33	59.64	12 76
Carpenters and turners	"	.....	10 86	10 32	58.73	10 59
Fork makers	"	.....	11 44	10 51	48.33	10 98
Grinders	"	.....	14 49	13 53	53.33	13 96
Hoe makers	"	.....	10 00	9 00	58.00	9 50
Machinists	"	.....	12 63	11 35	58.50	11 99
Polishers	"	.....	13 25	11 42	65.45	12 42
Rake makers	"	.....	8 75	7 88	58.00	8 31
Scythe makers	"	.....	13 70	12 36	53.60	13 06
Agricultural Implement Works:						
Blacksmiths	"	.....	8 63	9 77	60.51	9 13
"	.....	M	4 33	3 79	60.00	4 04
Knife and bar makers	M	.....	8 06	7 42	60.00	7 73
"	.....	M	2 54	2 95	60.00	2 79
Machinists	M	.....	9 20	9 82	59.98	9 47
"	.....	M	3 22	3 33	60.00	3 27
Moulders	M	.....	11 01	11 74	59.63	11 37
"	.....	M	3 18	3 03	60.00	3 11
Painters	M	.....	9 61	10 43	59.67	9 77
"	.....	M	4 15	3 68	60.00	3 90
Woodworkers	M	.....	8 73	8 65	59.87	8 70
"	.....	M	3 63	3 38	60.00	3 46
Apprentices (various)	M	.....	3 21	3 36	57.78	3 29
Axe factory workers:						
Axe makers	"	.....	9 87	8 95	59.73	9 41
Finishers	"	.....	7 50	9 66	49.80	9 23
Forgers	"	.....	9 62	8 60	57.88	9 20
Grinders	"	.....	9 64	9 14	58.76	9 34
Polishers	"	.....	10 66	8 94	57.56	9 78
Temperers	"	.....	10 05	11 17	57.60	11 12
Axle factory workers:						
Blacksmiths	"	.....	15 00	15 00	60.00	15 00
Machinists	"	.....	6 60	7 67	60.00	7 04
Bakers	"	.....	8 24	7 88	62.00	8 05
Barbers	"	.....	9 00	9 00	60.00	9 00
Biscuit packers	.....	F	2 92	2 90	58.00	2 91
Blacksmiths, (general)	M	.....	9 23	8 42	58.73	8 89
" helpers	"	.....	6 78	6 37	54.10	6 58
Boiler and engine works:						
Blacksmiths	"	.....	9 54	9 67	57.15	9 60
Boiler makers	"	.....	9 46	9 61	58.25	9 53
Machinists	"	.....	10 09	9 99	58.42	10 04
"	.....	M	3 12	3 15	59.00	3 13
Moulders	M	.....	9 91	10 24	57.06	10 07
"	.....	M	3 44	3 55	57.00	3 44
Pattern makers	M	.....	11 75	11 76	58.98	11 75
Painters	"	.....	8 72	8 46	57.26	8 52
Wood workers	"	.....	9 78	9 60	58.63	9 69
Bookbinders	"	.....	12 30	12 18	57.43	12 24
"	.....	M	3 25	3 27	57.60	3 26

Note.—The letters M and F in first and second columns denote *male* and *female*.

TABLE No. XXIV.—LABOUR AND WAGES.—*Continued.*

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople— Over 16	Under 16	Wages for week ending April 26.	Wages for week ending Oct. 25.	Average per week for the two weeks of— Hours employed.	Earnings.
			$ c.	$ c.		$ c.
Bookbinders	F		3 48	3 33	57.94	3 41
"		F	2 47	2 29	58.00	2 39
Book keepers	M		11 84	11 82	57.00	11 83
"	F		4 93	4 87	54.00	4 90
Book rulers	M		11 83	11 83	58.00	11 83
Boot and shoe operatives:						
Bottomers	"		9 49	12 22	59.00	10 75
Cutters	"		7 61	7 74	59.00	7 68
Finishers	"		7 80	7 80	59.00	7 80
"	F		3 63	3 42	59.00	3 53
Fitters	"		4 79	4 36	57.29	4 57
Lasters	M		7 23	7 06	58.55	7 15
Machine operators	"		8 87	9 61	59.00	9 27
"	F		4 83	5 39	59.06	5 16
Pasters	"		3 09	3 09	59.00	3 09
Turnmen	M		8 67	11 00	58.50	9 25
Sole cutters	"		7 95	8 00	59.00	7 98
Brass finishers	"		9 86	9 86	60.00	9 86
" moulders	"		10 29	10 29	58.50	10 29
Brewery and distillery operatives:						
Bottlers	"		7 19	7 05	60.00	7 11
"		M	3 27	2 86	60.00	3 08
Brewers	M		10 68	10 40	72.00	10 53
Cellarmen	"		8 01	7 56	60.00	7 79
Distillers	"		11 54	11 83	60.00	11 71
Malsters	"		8 30	8 45	64.00	8 35
Pedders	"		8 46	8 51	60.00	8 49
Bricklayers	"		14 53	15 21	58.89	14 87
Brick makers	"		9 33	9 33	60.00	9 33
Bridge makers operatives:						
Blacksmiths	"		11 81	11 35	58.00	11 52
Builders	"		7 45	7 65	60.00	7 59
Fitters	"		11 10	11 05	58.10	11 07
Machinists	"		10 27	10 22	58.00	10 24
Pattern makers	"		13 36	12 05	58.00	12 71
Riveters	"		8 98	9 78	51.93	9 53
Burnishers	"		12 86	18 00	60.00	15 88
Butchers	"		10 08	9 92	58.42	10 00
Carpenters	"		10 30	10 50	59.20	10 40
Carters	"		6 55	6 20	60.00	6 33
Carriage furnishing factories:						
Blacksmiths	"		10 32	11 50	60.00	10 74
Machinists	"		10 50	9 00	60.00	9 67
Steel workers	"		9 00	9 00	60.00	9 00
Wood workers	"		10 23	11 43	60.00	11 03
Carriage makers operatives:						
Blacksmiths	"		9 43	9 42	59.63	9 42
"		M	2 83	2 75	59.00	2 79
Painters	M		9 00	8 36	59.84	9 17
"		M	3 04	2 92	60.00	2 99
Trimmers	M		9 97	10 35	58.67	10 15
"		M	2 58	3 05	59.00	2 80
Wood workers	M		9 36	9 00	59.12	9 19
"		M	3 03	2 89	60.00	2 96
Cigar factory operatives:						
Bunch breakers	F		4 14	3 51	60.00	3 80
Cigar makers	M		9 59	9 31	58.07	9 45
"		M	3 92	3 47	59.60	3 67
"	F		3 76	3 69	59.72	3 72
"		F	1 88	2 00	58.00	1 94
Packers	M		9 67	9 67	58.00	9 67
"	F		3 29	3 44	60.00	3 36
Strippers	"		2 31	2 57	60.00	2 39
"		M	2 35	1 79	60.00	2 05

TABLE No. XXIV.—LABOUR AND WAGES.—*Continued.*

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople— Over 16.	Under 16.	Wages for week ending April 26.	Wages for week ending Oct. 25.	Average per week for the two weeks of— Hours employed.	Earnings.
			$ c.	$ c.		$ c.
Coal heavers	M		9 92	10 11	65.83	10 01
Collar makers	"		12 00	12 00	60.00	12 00
Confectioners	"		9 44	7 83	59.94	8 48
"		M	3 99	3 90	60.00	3 94
"	F		2 49	2 41	60.00	2 44
Confectionery packers	"		3 42	3 18	60.00	3 29
Coopers	M		8 96	9 06	60.05	9 01
Coppersmiths	"		20 28	20 28	58.50	20 28
Corset makers	F		4 00	4 67	59.00	4 40
Cotton batting mill operatives:						
Batting rollers	"		3 60	3 60	60.00	3 60
Carders	M		4 50	4 50	60.00	4 50
Lap carriers	"		3 75	3 50	60.00	3 63
Lapper feeders	"		6 75	6 75	60.00	6 75
Packers		M	2 75	2 75	60.00	2 75
Cotton mill operatives:						
Beamers	M		11 13	10 90	60.00	11 02
Carders	"		8 21	8 30	59.55	8 26
Card grinders	"		8 80	8 30	60.00	8 58
Card tenders		M	3 51	3 42	58.25	3 47
Card strippers	M		6 60	6 30	59.40	6 48
Doffers		F	2 51	2 31	60.00	2 41
"		M	2 02	1 94	60.00	1 98
Drawing tenders	F		4 27	4 07	60.50	4 18
Dressers	M		8 95	8 99	60.00	8 97
Dyers	"		7 50	7 20	59.91	7 35
Finishers	"		7 48	7 24	60.00	7 35
"	F		4 72	4 69	60.00	4 71
Foremen	M		13 51	13 02	60.00	13 27
Intermediate tenders	F		4 32	4 13	60.00	4 22
Lapper tenders	M		7 50	7 33	60.00	7 42
Loom fixers	"		10 70	10 73	59.46	10 71
Nappers	"		6 72	6 58	60.00	6 65
Picker tenders	"		6 14	5 96	60.00	6 05
"	F		5 52	4 85	56.67	5 22
Reelers	"		3 45	3 53	60.00	3 49
Roving hands	M		5 32	5 20	60.00	5 26
"		M	2 09	2 02	60.00	2 05
"	F		4 60	4 75	60.00	4 67
Section hands	M		9 62	9 31	60.00	9 47
Slasher tenders	"		9 87	9 83	58.33	9 85
Slubber "	F		4 89	3 77	60.00	4 33
Speeder "	"		4 72	4 55	60.00	4 64
Spinners	M		7 80	7 37	59.45	7 69
"		M	2 98	2 92	60.00	2 95
"	F		4 53	4 57	59.85	4 55
"		F	2 82	2 74	60.00	2 77
Spoolers		"	2 48	2 32	61.23	2 39
Twisters	F		3 75	3 51	60.00	3 52
Warpers	"		4 34	4 44	59.57	4 39
Waste pickers	"		3 13	3 11	60.00	3 12
Weavers	M		6 84	6 74	59.42	6 72
"	F		6 10	5 76	58.88	5 93
"		F	5 11	3 30	60.00	4 28
Web drawers	F		6 04	6 03	59.51	6 03
Winders	"		3 74	3 47	58.31	3 60
"		F	2 87	2 87	62.40	2 87
Dressmakers	F		4 53	4 18	59.80	4 35
Engineers (mechanical)	M		30 00	30 00	60.00	30 00
" (stationary)	"		9 52	9 60	60.78	9 56
Engravers	"		11 17	10 43	54.00	10 77
Fanning mill makers	"		10 00	9 00	60.00	9 50
Felt makers	"		7 07	6 07	59.27	6 87
"	F		4 33	4 33	60.00	4 33

TABLE No. XXIV.—LABOUR AND WAGES.—*Continued.*

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople— Over 16.	Under 16.	Wages for week ending April 26.	Wages for week ending Oct. 25.	Average per week for the two weeks of— Hours employed.	Earnings.
			$ c.	$ c.		$ c.
File cutters	M	.....	6 00	6 00	59.00	6 00
Firemen (Stationary engines)	"	.....	9 46	8 69	66.49	9 08
Flour packers	"	.....	7 99	8 43	60.00	8 22
Foremen (various)	"	.....	16 06	15 90	59.76	15 98
Foundries (general):						
Blacksmiths	"	.....	10 32	10 34	59.96	10 33
Machinists	"	.....	9 63	9 52	59.41	9 58
Machinists	.....	M	3 08	3 07	60.00	3 07
Moulders	M	.....	10 11	9 91	58.25	10 02
Pattern makers	"	.....	11 84	11 57	60.00	11 72
Woodworkers	"	.....	9 30	8 95	57.20	9 12
"	.....	M	3 00	4 00	59.00	3 38
Fruit canning operatives:						
Box nailers	M	.....	7 00	7 00	60.00	7 00
Can makers	"	.....	15 00	13 50	60.00	14 05
Cappers	"	.....	12 00	11 67	60.00	11 78
Fruit cleaners	F	.....	3 25	3 55	60.00	3 55
"	.....	F	2 00	2 00	60.00	2 00
Labellers	F	.....	5 00	3 72	60.00	3 90
"	.....	F	2 00	2 00	60.00	2 00
Press boys	.....	M	4 00	4 33	60.00	4 20
Solderers	.....	"	3 50	3 50	60.00	3 50
Furniture factory workers:						
Cabinet makers	M	.....	9 77	9 38	59.69	9 57
"	.....	M	2 91	2 86	60.00	2 88
Carvers	M	.....	10 54	10 33	59.00	10 44
Chair makers	"	.....	8 56	9 00	60.00	8 70
Finishers	"	.....	9 14	8 96	58.81	9 05
Machine hands	"	.....	9 08	9 10	58.82	9 09
Turners	"	.....	9 99	9 73	58.44	9 86
Varnishers and polishers	"	.....	8 33	9 00	56.25	8 67
Upholsterers	"	.....	10 69	10 35	57.90	10 52
"	.....	M	3 60	3 40	59.00	3 50
"	F	.....	4 50	4 17	59.00	4 30
Gas fitters	M	.....	9 60	9 57	60.00	9 58
Gas works employees:						
Lamp lighters	"	.....	7 54	7 71	61.64	7 62
Lamp makers	"	.....	9 61	8 50	60.00	8 97
Metre reparers	"	.....	9 00	8 94	60 00	8 97
Pipe layers	"	.....	9 28	8 97	60.00	9 08
Stokers	"	.....	11 27	12 24	60.00	11 77
Glass factory operatives:						
Cleaners	F	.....	3 00	3 00	48.00	3 00
Clippers	M	.....	7 50	.....	48.00	7.50
Firemen	"	.....	12 50	12 50	48.00	12 50
Glass blowers	"	.....	23 46	21 49	48.02	22 52
"	.....	M	3 66	3 62	48.00	3 64
Grinders	M	.....	9 50	9 50	48.00	9 50
Mixers	"	.....	9 33	8 80	48.00	9 09
Mould makers	"	.....	13 00	13 00	48.00	13 00
Packers	"	.....	8 46	8 46	48.00	8 46
Pot makers	"	.....	12 83	12 83	48.00	12 83
Shearers	"	.....	14 00	14 00	48.00	14 00
Glaziers	"	.....	10 50	10 00	60.00	10 20
Glove cutters	"	.....	13 00	13 00	59.00	13 00
Glove makers	"	.....	11 58	11 29	60.00	11 43
"	F	.....	4 72	5 17	60.00	4 95
Harness makers	M	.....	8 89	8 93	58.77	8 91
Hat factory operatives:						
Binders	"	.....	14 40	14 33	59.00	14 36
Blockers	"	.....	9 35	8 57	55.90	8 95
Cap makers	F	.....	3 66	3 80	59.00	3 73
Cutters	M	.....	13 25	13 25	59.00	13 25
Finishers	F	.....	3 46	3 37	58.88	3 41

TABLE No. XXIV.—LABOUR AND WAGES.—*Continued.*

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople— Over 16.	Under 16.	Wages for week ending April 26.	Wages for week ending Oct. 25.	Average per week for the two weeks of— Hours employed.	Earnings.
			$ c.	$ c.		$ c.
Hat factory operatives (*continued*):						
Sewers	F	.....	5 00	4 87	59.00	4 90
Trimmers	"	.....	4 00	2 59	59.00	3 35
Horseshoers	M	.....	9 50	9 50	60.00	9 50
Hotel employees (with board):						
Bar tenders	"	.....	6 39	6 39	72.00	6 39
Bell boys	.....	M	1 80	1 80	72.00	1 80
Baggagemen	"	.....	3 55	3 55	72.00	3 55
Chambermaids	F	.....	2 17	2 18	62.00	2 17
Cooks	"	.....	4 82	4 82	72.00	4 82
Dining-room girls	"	.....	2 29	2 29	70.94	2 29
Kitchen girls	"	.....	2 14	2 14	72.00	2 14
Laundresses	"	.....	2 15	2 15	72.00	2 15
Office clerks	M	.....	6 66	6 66	72.00	6 66
Omnibus drivers	"	.....	4 83	4 83	72.00	4 83
Porters	"	.....	3 56	3 56	72.00	3 56
Stablemen	"	.....	3 25	3 25	72.00	3 25
Iron turners	"	.....	11 18	11 64	60.00	11 34
Japanners	"	.....	9 48	9 33	60.00	9 41
"	F	.....	3 13	3 03	58.00	3 09
Jewellers	M	.....	7 96	7 96	58.00	7 96
Knitting factory operatives:						
Carders	"	.....	7 43	7 18	59.03	7 30
Finishers	F	.....	3 63	4 08	59.00	3 85
"	.....	F	2 48	2 71	59.00	2 62
Knitters	M	.....	8 30	7 41	59.00	7 83
"	F	.....	3 35	3 09	59.00	3 21
Menders	"	.....	2 00	1 75	59.00	1 88
"	.....	F	1 50	1 75	59.00	1 63
Pickers	M	.....	5 68	5 28	59.00	5 48
Piecers	.....	M	2 47	2 40	59.00	2 44
"	F	.....	2 55	2 68	59.00	2 61
"	.....	F	1 72	1 94	59.00	1 76
Reelers and spoolers	"	.....	2 62	2 69	59.00	2 66
Scourers	M	.....	7 25	7 27	59.00	7 26
Sewers	F	.....	3 44	3 29	59.00	3 36
Spinners	M	.....	6 88	8 74	59.00	7 73
"	.....	M	2 97	2 78	59.00	2 88
Lathers	"	.....	9 29	11 26	56.71	10 27
Lithographers	"	.....	14 00	14 17	60.00	14 09
Locksmiths	"	.....	12 00	12 00	60.00	12 00
Lumber mill operatives:						
Cullers	"	.....	9 14	9 14	66.22	9 14
Edgers	"	.....	9 00	9 00	72.00	9 00
Filers	"	.....	10 21	10 21	65.01	10 21
Foremen	"	.....	21 26	21 26	60.00	21 26
Jointers	"	.....	9 75	9 75	54.00	9 75
Labourers	"	.....	6 81	6 78	58.56	6 79
Measurers	"	.....	8 68	8 68	65.68	8 68
Sawyers	"	.....	9 16	8 69	59.85	8 92
Shipping clerks	"	.....	9 60	9 60	59.80	9 60
Shovers	"	.....	10 50	10 50	60.00	10 50
Slabbers	"	.....	8 75	8 75	72.00	8 75
Machinists, (general)	"	.....	9 98	10 63	60.06	10 29
Malleable iron works:						
Annealers	"	.....	14 00	14 00	59.00	15 00
Chain fitters	"	.....	12 00	12 00	59.00	12 00
Coremakers	"	.....	6 00	6 00	59.00	6 00
"	.....	M	3 50	3 50	59.00	3 50
Moulders	"	.....	14 83	13 81	59.00	14 34
Packers	"	.....	7 50	7 50	59 00	7 50
Pattern makers	"	.....	10 71	11 00	59.00	10 85
Stokers	"	.....	8 40	8 00	59.00	8 20
Marble cutters	"	.....	9 87	9 80	58.82	9 84

TABLE No. XXIV.—LABOUR AND WAGES.—*Continued.*

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople— Over 16.	Under 16.	Wages for week ending April 26.	Wages for week ending Oct. 25.	Average per week for the two weeks of— Hours employed.	Earnings.
			$ c.	$ c.		$ c.
Marble polishers	M		7 39	7 35	59.00	7 37
Millers	"		11 02	10 94	66.00	10 98
Milliners	F		7 16	6 89	59.18	7 03
Millwrights	M		12 91	11 56	60.17	12 22
Miscellaneous occupations	"		7 46	6 11	54.59	6 78
Nail makers	"		16 90	17 83	58.66	17 37
Newspaper employees:						
Carrier boys		M	1 81	1 85	60.00	1 83
Compositors	M		9 67	9 06	58.33	9 37
"		M	3 18	3 19	58.90	3 19
Editors	M		13 40	13 20	61.66	13 30
Reporters	"		14 18	14 16	60.09	14 17
Mail clerks	"		13 75	12 73	60.00	13 22
Pressmen	"		9 95	10 05	62.40	10 00
Office boys		M	3 17	3 17	62.67	3 17
Organ factory workers:						
Action makers	M		9 00	9 00	58.00	9 00
Bellows "	"		9 50	9 50	58.00	9 50
Case "	"		7 78	9 50	58.00	8 46
Trimmers	"		10 00	9 00	58.00	9 50
Tuners	"		10 50	11 67	58.00	11 00
Pattern makers	"		10 00	10 00	58.00	10 00
Painters, (house, etc)	"		9 62	9 54	58.87	9 57
" (ornamental)	"		13 05	12 52	52.18	12 76
Paper bag makers	"		6 00	6 00	58.00	6 00
"	F		3 62	3 61	57.17	3 62
Paper hangers	M		7 00	6 50	53.00	6 80
Paper mill operatives:						
Assistant tenders	"		7 45	7 35	59.00	7 40
Bleachers	"		6 00	5 50	59.00	5 75
Cutter tenders		M	2 00	2 00	59.00	2 00
Finishers	M		7 18	6 78	59.00	6 98
"	F		5 00	4 50	58.00	4 73
Machine tenders	M		12 13	12 00	59.00	12 06
Rag cutters	"		8 79	8 79	58.00	8 79
"	F		3 60	3 60	58.00	3 60
Rag pickers	"		4 00	4 00	58.00	4 00
Piano factory workers:						
Action finishers	M		7 88	8 06	60.00	7 97
Carvers	"		9 20	8 78	60.00	9 00
Case and stop makers	"		12 40	11 39	60.00	11 91
Fly finishers	"		13 14	15 25	60.00	14 26
Key makers	"		12 00	12 00	60.00	12 00
Machine hands	"		11 00	11 00	60.00	11 00
Plate drillers	"		10 50	10 50	60.00	10 50
Polishers	"		12 00	12 00	60.00	12 00
Porters	"		9 20	8 83	60.00	9 00
Sounding board makers	"		11 08	13 85	60.00	12 52
Stringers	"		9 00	9 00	60.00	9 00
Tone regulators	"		15 75	13 63	60.00	14 69
Tuners	"		9 86	9 44	60.00	9 64
Varnishers	"		8 20	8 92	59.00	8 54
Plasterers	"		13 33	13 29	60.33	13 31
Plumbers	"		10 88	10 79	60.00	10 84
Potters	"		10 03	10 10	60.60	10 07
Pulp makers	"		8 00	6 83	59.67	7 45
Pump makers	"		10 50	10 50	60.00	10 50
Railway shop workers:						
Blacksmiths	"		9 23	9 40	51.88	9 32
Boiler makers	"		12 05	12 05	54.00	12 05
Car builders	"		10 12	9 67	57.09	9 87
Car painters	"		8 24	8 67	55.94	8 46
Car repairers	"		9 90	10 46	59.67	10 17
Drillers	"		7 39	7 39	54.40	7 39

TABLE No. XXIV.—LABOUR AND WAGES.—*Continued.*

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople— Over 16	Under 16	Wages for week ending April 26.	Wages for week ending Oct. 25.	Average per week for the two weeks of— Hours employed.	Earnings.
			$ c.	$ c.		$ c.
Railway shop workers *(continued)*:						
Engine cleaners	M	.....	6 54	6 84	59.25	6 64
Fitters	"	.....	10 81	10 86	55.40	10 84
Foremen	"	.....	15 11	15 11	59.67	15 11
Machine men	"	.....	9 01	9 80	55.36	9 35
Planers	"	.....	7 29	7 29	54.00	7 29
Strippers	"	.....	5 81	5 81	54.00	5 81
Turners	"	.....	10 91	10 91	54.36	10 91
Upholsterers	"	.....	7 76	10 20	47.25	8 98
Railway employees, (general):						
Baggagemen	"	.....	8 28	8 22	61.11	8 25
Brakemen	"	.....	8 60	9 01	68.36	8 81
Car cleaners	"	.....	8 35	8 29	60.00	8 32
Car examiners	"	.....	8 76	8 76	60.00	8 76
Checkers	"	.....	9 20	9 20	60.00	9 20
Conductors	"	.....	14 08	14 53	64.58	14 32
Dispatchers and operators	"	.....	8 84	8 81	60.00	8 83
Engineers	"	.....	16 89	19 72	66.13	18 32
Firemen	"	.....	9 23	10 52	65.09	9 88
Flagmen	"	.....	7 47	7 13	60.00	7 30
Porters	"	.....	9 90	9 97	66.00	9 94
Road masters	"	.....	18 75	18 75	60.00	18 75
Section men	"	.....	7 09	7 07	60.00	7 08
Station agents	"	.....	9 81	10 01	65.57	9 91
Switchmen	"	.....	7 51	7 53	60.00	7 52
Watchmen	"	.....	7 50	7 57	60.00	7 53
Yard masters	"	.....	10 85	10 85	72.00	10 85
Yard men	"	.....	8 69	8 78	60.00	8 73
Rolling mill employees:						
Blacksmiths	"	.....	13 50	13 50	66.00	13 50
Firemen	"	.....	7 14	6 88	66.00	7 00
Heaters	"	.....	22 23	16 69	66.07	18 94
" assistants	"	.....	8 50	7 27	67.78	7 81
Machinists	"	.....	12 83	12 50	66.00	12 67
Rollers	"	.....	12 50	10 50	64.00	11 50
Roughers	"	.....	14 67	14 50	63.33	14 58
Straighteners	"	.....	7 67	7 00	60.83	7 33
Saddlers	"	.....	8 63	8 63	58.50	8 63
Safe makers	"	.....	9 55	10 17	59.00	9 87
Salesmen	"	.....	9 15	9 25	60.71	9 20
Saleswomen	F	.....	3 78	3 78	58.88	3 78
Sash, door and blind makers	M	.....	10 65	11 00	59.00	10 83
Sawyers (pit)	"	.....	11 00	11 00	60.00	11 00
Saw factory employees:						
Etchers	"	.....	7 13	7 88	60.00	7 50
Grinders	"	.....	15 75	15 75	60.00	15 75
Handlers	"	.....	12 00	12 00	60.00	12 00
Packers	"	.....	9 00	9 00	60.00	9 00
Polishers	"	.....	9 00	9 00	60.00	9 00
Saw makers	"	.....	13 50	13 50	60.00	13 50
Temperers	"	.....	9 75	7 75	60.00	8 75
Scale factory employees:						
Blacksmiths	"	.....	9 90	10 50	59.00	10 20
Carpenters	"	.....	9 64	9 42	59.00	9 50
Moulders	"	.....	15 00	15 00	59.00	15 00
Scale makers	"	.....	9 57	9 68	60.23	9 63
Painters	"	.....	9 20	10 67	59.00	10 00
Screw makers	"	.....	7 47	7 41	60.00	7 44
"	F	.....	3 54	3 54	60.00	3 54
Seamstresses	"	.....	6 00	6 00	67.88	6 00
Sewing machine factory employees:						
Carpenters	M	.....	8 99	9 25	58.74	9 12
Fitters	"	.....	11 79	10 07	59.00	10 91
"	.....	M	3 20	3 39	59.00	3 30

TABLE No. XXIV.—LABOUR AND WAGES.—*Continued.*

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople— Over 16	Under 16	Wages for week ending April 26.	Wages for week ending Oct. 25.	Average per week for the two weeks of— Hours employed.	Earnings.
			$ c.	$ c.		$ c.
Sewing machine factory employees *(con.)*:						
Machinists	M	.....	11 07	11 21	58.88	11 14
"	.....	M	2 71	2 89	59.00	2 79
Moulders	M	.....	13 04	13 22	59.00	13 12
Ornamenters	"	.....	7 17	8 53	57.50	7 85
Tool makers	"	.....	11 77	12 41	59.00	12 06
Varnishers	"	.....	6 58	7 36	59.00	7 02
Ship carpenters	"	.....	8 85	8 91	58.00	8 87
Shippers	"	.....	7 86	8 48	60.00	8 14
Shirt makers	F	.....	3 75	4 00	60.00	3 88
Shoemakers	M	.....	8 37	8 71	57.92	8 54
Silver platers	"	.....	8 83	12 15	57.00	10 87
Soap makers	"	.....	6 96	6 96	59.00	6 96
Spring bed makers	"	.....	9 00	9 00	60.00	9 00
Stone cutters	"	.....	15 37	13 34	59.50	14 41
Stone masons	"	.....	13 94	14 79	58.77	14 38
Stove foundry employees:						
Assorters	"	.....	.....	6 00	59.00	6 00
Blacksmiths	"	.....	8 83	9 68	60.00	9 25
Carpenters	"	.....	9 30	10 15	60.00	9 74
Core makers	"	.....	7 71	7 41	58.52	7 59
Dressers	"	.....	8 40	8 10	61.88	8 25
Finishers	"	.....	9 00	9 00	60.00	9 00
Fitters	"	.....	8 37	9 01	58.58	8 68
Grinders	"	.....	.....	6 38	59.00	6 38
Machinists	"	.....	9 43	9 07	60.00	9 25
Melters	"	.....	8 38	8 78	57.00	8 58
Moulders	"	.....	11 83	11 50	59.06	11 67
"	"	M	3 46	3 91	60.00	3 68
Mounters	"	.....	10 62	10 57	58.83	10 60
Nickle platers	"	.....	9 88	9 91	59.13	9 89
Pattern makers	"	.....	11 55	11 48	59.96	11 51
Polishers	"	.....	10 29	10 48	59.51	10 38
Tailors	"	.....	9 80	9 42	59.70	9 62
Tailoresses	F	.....	4 09	3 91	54.39	4 00
"	.....	F	2 36	2 36	54.00	2 36
Tannery employees:						
Beamsmen	M	.....	6 72	8 45	60.00	7 63
Curriers	"	.....	7 90	8 34	59.83	8 13
Tanners	"	.....	7 60	7 95	59.92	7 80
Teamsters	"	.....	7 87	7 84	66.51	7 86
Telegraph operators	"	.....	9 55	9 50	60.20	9 55
Tinsmiths	"	.....	8 78	8 92	59.65	8 84
"	.....	M	2 98	3 05	60.00	3 02
"	F	.....	2 84	2 60	60.00	2 71
Tobacco makers	M	.....	10 71	10 57	54.00	10 64
"	.....	M	3 00	3 00	54.00	3 00
"	F	.....	4 00	4 00	54.00	4 00
"	.....	F	3 00	3 00	54.00	3 00
Trunk makers	M	.....	8 13	8 12	59.63	8 13
"	.....	M	3 00	3 00	59.00	3 00
Trunk and tray liners	F	.....	3 39	3 37	60.15	3 38
Undertakers' employees:						
Coffin makers	M	.....	8 48	8 78	60.00	8 67
Finishers	"	.....	10 22	10 63	60.00	10 43
Robe makers	F	.....	2 50	2 88	60.00	2 65
Waggonmakers	M	.....	14 04	8 04	59.90	10 37
Watchmakers	"	.....	11 78	11 56	59.00	11 67
Watchmen	"	.....	8 32	8 28	69.94	8 30
Wheel factory employees:						
Benders	"	.....	9 00	9 00	60.00	9 00
Machine hands	"	.....	9 06	8 67	60.00	8 87
Morticers	"	.....	10 50	10 00	60.00	10 25
Spoke turners	"	.....	8 64	8 20	60.00	8 42
Wheel makers	"	.....	8 95	8 58	59.25	8 77

TABLE No. XXIV.—LABOUR AND WAGES.—*Continued.*

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople—		Wages for week ending April 26.	Wages for week ending Oct. 25.	Average per week for the two weeks of—	
	Over 16.	Under 16.			Hours employed.	Earnings.
			$ c.	$ c.		$ c.
Whip makers	M	.....	7 20	7 20	60.00	7 20
"	F	.....	3 40	3 40	60.00	3 40
Wire weavers	M	.....	12 00	12 00	60.00	12 00
"	.....	M	5 50	5 25	60.00	5 38
Wire workers	M	.....	9 00	9 00	60.00	9 00
"	.....	M	3 60	3 60	60.00	3 60
Wood carvers	M	.....	9 00	9 00	60.00	9 00
Wood turners	"	.....	8 00	7 98	52.57	7 99
Woollen factory operatives:						
Burlers	F	.....	3 80	3 53	62.50	3 67
Card cleaners	M	.....	5 50	5 00	62.57	5 25
Carders	"	.....	6 87	7 03	59.97	6 95
"	.....	M	3 06	3 03	60.00	3 05
"	F	.....	3 49	3 31	60.00	3 39
Darners	"	.....	4 35	4 20	64.50	4 28
Drawers-in	"	.....	4 00	3 63	60.67	3 82
Dressers	M	.....	6 11	6 34	60.00	6 22
"	F	.....	3 79	3 74	60.00	3 77
Drum tenders	"	.....	4 25	3 75	59.00	4 00
Dyers	M	.....	7 56	7 27	59.81	7 42
Finishers	"	.....	6 96	6 95	60.08	6 96
"	.....	M	3 22	3 24	60.00	3 33
"	F	.....	4 20	4 17	60.00	4 18
Fullers	M	.....	6 77	6 34	59.90	6 57
Foremen	"	.....	13 14	13 01	60.00	13 08
Gigger tenders	F	.....	3 60	3 60	61.00	3 60
Loom fixers	M	.....	10 20	9 83	60.55	10 01
Pickers	F	.....	4 69	4 69	60.00	4 69
Picker tenders	.....	F	3 12	3 12	59.80	3 12
Piecers	F	.....	3 58	3 45	60.00	3 51
"	.....	F	2 94	2 91	60.24	2 93
"	.....	M	2 83	2 87	60.00	2 85
Reelers	.....	F	3 41	3 09	60.00	3 26
Scourers	M	.....	7 32	7 32	63.00	7 32
Shears tenders	F	.....	4 70	4 70	64.00	4 70
Sorters	M	.....	6 25	6 12	60.00	6 18
Speckers	F	.....	3 60	3 60	64.50	3 60
Spinners	M	.....	8 23	8 10	59.95	8 17
Spoolers	.....	F	2 91	2 93	60.00	2 92
Twisters	.....	"	3 21	3 07	60.00	3 14
Warpers	F	.....	4 74	4 69	60.00	4 72
"	.....	F	2 33	2 33	60.00	2 33
Weavers	F	.....	4 61	4 58	60.21	4 59
"	M	.....	6 00	6 00	60.00	6 00
Winders	.....	F	3 17	3 18	60.00	3 17

LABOUR AND WAGES.

TABLE No. XXV.—Showing by occupations the averages of time employed, wages earned and cost of living in Toronto, Guelph, Stratford, London, Chatham, St. Thomas, Brantford, Galt, Dundas, Hamilton, St. Catharines, Merritton, Thorold, Oshawa, Belleville, Kingston, Brockville, Cornwall and Ottawa for the year ending 31st day of October, 1884, based on returns collected from 2,853 workpeople.

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople— Over 16.	Under 16.	No. of Dependents.	Hours employed per week.	Days employed per year.	Yearly wages from occupation.	Extra earnings.	Wife and children's earnings.	Total earnings.	Cost of living.
						$ c.	$ c.	$ c.	$ c.	$ c.
Agricultural implement workers:										
Blacksmiths	M		2.63	60.00	260.63	399 58			399 58	374 68
Drillers	"		2.00	60.00	223.50	245 75			245 75	245 75
Foremen	"		4.33	60.00	285.00	663 33			663 33	566 67
Machinists	"		2.86	59.11	248.58	401 97	4 17	8 67	414 81	394 92
Melters	"		1.33	58.00	296.67	355 00			355 00	336 67
Moulders	"		2.00	58.64	239.16	460 24		4 00	464 24	381 48
Painters	"		2.68	59.36	238.00	331 89		5 26	337 15	355 89
Vice hands	"		2.50	51.00	280.00	375 00	12 50		387 50	371 00
Wood workers	"		3.87	59.13	246.60	400 60	1.33		401 93	403 93
Apprentices, (various)	"			59.00	289.59	164 34	57		164 91	170 03
Axe factory workers:										
Axe makers	"		3.40	56.80	271.60	660 00			660 00	520 00
Finishers	"		3.25	48.00	262.50	418 75		18 75	437 50	315 00
Forgers	"		4.33	48.00	250.00	500 00		116 67	616 67	416 67
Grinders	"		1.67	48.00	250.00	396 67			396 67	308 33
Polishers	"		2.38	55.05	297.00	454 38	5 00		459 38	403 50
Temperers	"		3.50	54.00	268.00	505 00			505 00	405 00
Barbers	"		2.80	69.60	300.00	464 00	5 00		469 00	382 00
Bakers	"		2.53	68.82	280.29	389 71		4 41	394 12	338 82
Blacksmiths, (general)	"		2.43	57.71	253.10	418 61	98	9 80	429 39	380 22
Boiler and engine works:										
Blacksmiths	"		3.00	57.75	292.50	461 25			461 25	383 13
Boiler makers	"		2.71	56.43	227.46	449 07		2 68	451 75	404 75
Machinists	"		2.15	56.70	286.95	494 20	7 25	2 00	503 45	392 60
Moulders	"		2.03	55.97	239.79	438 41	5 24		443 65	385 79
Wood workers	"		3.33	56.00	301.33	508 33			508 33	445 00
Box makers	"		1.75	59.00	299.50	390 75			390 75	385 75
Bookbinders	"		6.25	57.05	300.25	600 00	31 25	52 50	683 75	518 75
"	F			58.00	275.33	139 17			139 17	145 83
Bookkeepers	M		1.50	57.75	292.50	481 25			481 25	370 00
Brass finishers	"		.60	60.00	230.00	317 00			317 00	285 00
Brewers	"		2.29	66.00	273.71	472 43	11 43	7 14	491 00	346 29
Bricklayers	"		3.59	60.00	181.94	394 24	22 65	11 76	428 65	358 76
Brick makers	"		2.28	60.00	298.89	432 11			432 11	356 94
"		M		60.00	300.00	150 00			150 00	150 00
Butchers	M		2.86	58.29	262.86	426 14	40 00	10 71	476 85	405 71
Cap makers	F		.50	57.00	300.00	175 00			175 00	165 00
Carpenters	M		3.11	57.45	249.72	396 28	3 19	9 64	409 11	375 46
Carriage shops:										
Blacksmiths	"		1.78	59.33	291.11	431 19	11 19	9 96	452 34	363 81
Carvers	"		1.33	60.00	300.00	466 67			466 67	266 67
Painters	"		2.38	59.62	277.00	447 63	14 06		461 69	379 19
Trimmers	"		2.87	57.60	270.87	480 60	80	24 33	505 73	401 13
Wood workers	"		2.94	59.44	289.22	432 09	6 59	36 13	474 81	359 13
Cigar makers	"		.79	54.50	275.57	384 75	1 71	4 43	390 89	292 00
"		M		60.00	268.33	137 67			137 67	159 33
"	F		.26	58.74	271.79	167 84		5 26	173 10	179 79
Clerks	M		1.67	59.00	302.25	369 50		20 83	390 33	350 83
"	F			63.00	283.33	188 33			188 33	175 00
Coachmen	M		2.50	69.00	332.50	377 00			377 00	356 50

Note.—In this table the number of dependents does not include the worker. The letters M and F in the first and second columns denote *male* and *female*.

TABLE No. XXV.—LABOUR AND WAGES.—*Continued.*

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople— Over 16.	Under 16.	No. of Dependents.	Hours employed per week.	Days employed per year.	Yearly wages from occupation.	Extra earnings.	Wife and children's earnings.	Total earnings.	Cost of living.
						$ c.	$ c.	$ c.	$ c.	$ c.
Coal heavers	M		2.40	67.20	234.20	359 30	12 50	10 50	382 30	332 50
Confectioners	"		2.09	60.00	294.36	504 64	.....	13 09	517 73	427 27
"	F		.33	59.33	254.94	111 94	.....	.....	111 94	120 72
Coopers	M		2.83	60.00	251.64	355 91	.....	.....	355 91	348 45
Coppersmiths	"		1.50	54.00	275.00	478 50	.....	.....	478 50	325 00
Corset makers	F		....	60.00	266.67	216 67	.....	.....	216 67	200 00
Cotton mill operatives:										
Carders	M		2.80	61.40	298.00	385 00	.....	.....	385 00	376 00
" helpers	F		1.50	60.00	232.50	186 25	.....	20 00	206 25	206 00
"	.....	F	....	62.50	290.00	127 50	.....	.....	127 50	127 50
Drawers-in	F		....	60.00	267.50	270 50	.....	.....	270 50	210 50
Dyers	M		1.00	61.66	280.00	380 00	.....	.....	380 00	315 56
Finishers	F		2.00	57.00	177.00	153 00	.....	5.00	158 00	175 00
Loom fixers	M		2.43	60.71	272.14	569 29	.....	.....	569 29	420 00
Spinners	"		2.00	60.00	233.75	399 50	.....	.....	399 50	357 50
"	F		.33	60.83	270.00	191 67	.....	.....	191 67	184 17
Spoolers	.....	F	....	62.50	290.00	108 38	.....	.....	108 38	108 39
Slasher tenders	M		2.67	60.67	273.33	371 67	.....	.....	371 67	335 00
Wareroom hands	"		1.75	60.50	277.50	406 25	.....	.....	406 25	343 75
"	F		.50	44.50	276.67	244 83	.....	.....	244 83	225 83
Warpers	"		.25	60.83	270.00	202 08	.....	.....	202 08	185 50
Weavers	"		.53	61.00	257.26	289 40	.....	2.67	292 07	242 47
Winders	"		.25	61.25	275.00	199 00	.....	.....	199 00	181 50
Dressmakers	"		.82	58.91	248.82	163 27	2 27	.....	165 54	171 18
Engineers (locomotive)	M		3.20	74.40	276.80	909 10	.....	.....	909 10	592 00
" (marine)	"		2.83	84.00	209.17	457 50	51 67	50 00	559 17	491 67
" (stationary)	"		2.86	62.23	296.57	416 06	7 40	22 86	446 32	371 51
Fanning mill makers	"		3.00	60.00	300.00	475 00	.....	.....	475 00	400 00
Firemen	"		1.42	63.42	262.42	344 58	4 17	8 33	357 08	314 67
Foremen (various)	"		4.05	60.12	284.18	831 59	29 41	7 35	868 35	654 88
Foundrymen, general:										
Machinists	"		3.25	59.50	302.17	469 92	.....	15 00	484 92	374 42
Moulders	"		2.93	58.15	250.60	429 05	2.00	3 75	434 80	415 33
Wood workers	"		3.25	60.00	293.75	508 00	.....	100 00	608 00	425 00
Furniture factory workers:										
Finishers	"		1.17	58.50	300.50	428 58	.....	.....	428 58	303 58
Machine hands	"		2.40	58.65	231.55	340 35	.....	.....	340 35	330 60
Upholsterers	"		1.41	55.41	283.12	443 58	12 06	11 76	467 40	389 11
Varnishers and polishers	"		1.33	56.00	275.00	391 00	.....	66 67	457 67	387 33
Gas fitters	"		3.60	62.40	302.40	486 80	.....	.....	486 80	416 00
General servants (with board)	F		....	70.50	365.00	84 75	1 00	.....	85 75	63 00
Glass packers	"		.50	60.00	250.00	160 00	.....	.....	160 00	178 00
Glove makers	M		3.00	60.00	299.00	640 00	.....	50 00	690 00	500 00
Harness makers	"		2.32	56.84	265.47	369 42	.....	9 22	378 63	347 84
Hat makers	"		.83	50.00	251.67	411 67	.....	.....	411 67	320 83
Helpers, (blacksmiths, etc)	"		1.82	56.57	252.99	300 32	.....	3 70	304 02	293 37
Horse shoers	"		2.40	60.00	292.40	465 20	.....	.....	465 20	367 60
Jewellers	"		2.50	57.00	300.83	582 33	.....	.....	582 33	478 33
Knitting factory operatives:										
Finishers	F		....	59.00	285.00	150 00	.....	.....	150 00	150 00
Knitters	"		....	59.00	281.00	176 00	.....	.....	176 00	145 00
Menders	"		....	59.00	285.00	80 00	.....	.....	80 00	80 00
Labourers	M		2.79	59.63	253.93	300 24	2 07	12 23	314 54	303 71
Lamp lighters	"		2.88	55.40	358.50	403 63	37 50	21 88	463 01	376 38
Lathers	"		2.88	60.00	245.75	432 38	11 50	19 37	463 25	304 63
Lumber mill operatives:										
Cullers	"		5.50	72.00	255.00	552 50	50 00	.....	602 50	537 50
Filers	"		1.50	63.00	300.00	478 50	.....	.....	478 50	375 00
Jointers	"		3.00	54.00	281.00	389 00	.....	55 00	444 00	243 00
Measurers	"		.75	63.00	275.00	448 25	6 25	.....	454 50	375 00
Sawyers	"		4.56	65.00	248.89	370 00	45 00	6 94	421 94	403 67
Shovers	"		2.00	60.00	200.00	350 25	.....	.....	350 25	320 75

TABLE No. XXV.—LABOUR AND WAGES.—*Continued.*

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople— Over 16.	Under 16.	No. of Dependents.	Hours employed per week.	Days employed per year.	Yearly wages from occupation.	Extra earnings.	Wife and children's earnings.	Total earnings.	Cost of living.
						$ c.	$ c.	$ c.	$ c.	$ c.
Machinists, general	M		2.97	58.78	241.98	394 67	8 06	4 29	407 02	372 54
Malsters	"		1.33	61.33	308.67	462 67			462 67	341 11
Marble cutters	"		3.00	57.25	285.31	433 06		1 25	434 31	364 19
Masons (stone)	"		2.80	60.00	181.60	407 10	17 50	5 00	429 60	350 80
Message boys		M		66.00	300.00	120 50	2 50		123 00	120 00
Millers	M		3.06	66.67	302.28	515 83		20 22	536 05	430 28
Milliners	F		.57	59.14	291.57	436 29			436 29	369 29
Millwrights	M		3.30	60.60	253.50	599 50		79 40	678 90	450 00
Miscellaneous occupations	"		2.58	58.21	241.24	378 32	8 29		386 61	360 18
"	F		.67	58.00	260.00	108 33			108 33	126 67
"		F		56.00	186.67	65 33			65 33	128 67
Nailors	M		1.67	60.00	260.00	540 83			540 83	383 33
Newspaper employees:										
Pressmen	"		1.67	59.33	303.78	480 00	36 33	33 33	549 66	362 11
Printers	"		1.93	56.32	274.56	423 99	4 48		428 47	391 56
Reporters	"		1.58	62.50	318.00	550 58	29 17		579 75	514 58
Packers	"		2.00	60.00	280.20	374 00			374 00	326 00
Painters (house, etc)	"		2.73	58.40	251.71	390 15	15 33	3 29	416 77	356 27
" (ornamental)	"		3.00	56.00	269.17	544 67	58 33	36 33	639 33	406 67
Paper hangers	"		2.67	52.00	300.00	414 00	33 33	25 00	472 33	400 00
Paper mill operatives:										
Bleachers	"			59.00	275.00	237 50			237 50	225 00
Cutter tenders	F			59.00	300.00	100 00			100 00	75 00
Finishers	M			59.00	275.00	237 50			237 50	225 00
Machine tenders	"		1.00	59.00	303.00	450 00			450 00	375 00
Pattern makers	"		2.57	59.00	267.43	558 71		14 29	573 00	449 43
Photographers	"		1.67	56.00	304.33	451 00			451 00	316 67
Piano makers	"		2.43	57.43	285.71	592 71		57 14	649 85	389 14
Picture framers	"		5.67	56.00	300.00	503 33		16 67	520 00	416 67
Plasterers	"		1.40	59.60	231.53	459 87		13	460 00	326 20
Plumbers	"		3.50	59.25	252.88	374 63	35 00		409 63	416 00
Porters	"		2.00	68.86	284 71	340 00			340 00	341 86
Potters	"		3.00	60.90	273.60	451 80		15 00	466 80	372 70
Pump makers	"		5.00	60.00	225.00	306 00	100 00		406 00	406 00
Railway shop workers:										
Blacksmiths	"		2.36	54.00	281.09	475 27			475 27	385 73
Car builders	"		4.00	58.50	295.00	518 75			518 75	508 75
Car repairers	"		2.50	63.00	295.75	443 75			443 75	418 75
Drillers	"		2.00	54.00	273.00	283 80			283 80	275 00
Fitters	"		2.36	53.78	262.80	478 47	4 44		482 91	381 04
Iron turners	"		2.67	53.83	264.42	495 00		6 25	501 25	425 92
Painters	"		3.20	54.80	237.87	378 80		3 33	382 13	389 47
Planers	"		2.67	55.00	279.16	336 83			336 83	314 17
Strippers	"			54.00	273.00	294 00			294 00	248 75
Railway employees, general:										
Baggagemen	"		3.00	62.00	307.33	504 67			504 67	445 00
Brakemen	"		.77	65.33	242.56	384 89	5 56		390 45	358 44
Cleaners	"		1.71	60.86	309.43	337 86			337 86	298 57
Foremen of departments	"		2.43	58.29	291.71	668 57			668 57	492 86
Station agents	"		1.80	50.40	309.67	780 00			780 00	490 00
Switchmen	"		2.67	60.00	283.67	415 00			415 00	358 33
Yardmen	"		3.20	64.80	315.20	384 80		35 00	419 80	382 80
Riveters, bridge works	"		2.83	60.00	286.00	420 83			420 83	391 67
Saddlers	"		3.33	54.00	300.00	438 00		25 00	463 00	420 00
Safe makers	"		2.33	60.00	300.00	483 33			483 33	387 33
Salesmen	"		4.00	65.82	304.50	486 00	8 33	33 33	527 66	456 50
Sash, door and blind makers	"		4.17	58.50	259.17	459 33			459 33	474 33
Scale makers	"		3.92	60.00	253.17	431 42			431 42	423 08
Screw makers	"		1.67	60.00	230.00	287 00			287 00	287 00
"	F			60.00	230.00	125 71			125 71	125 71
Seamstresses	"			69.00	300.00	292 50			292 50	247 50
Sewing machine operators	"		.16	58.00	273.50	181 33	6 67		188 00	169 50
Shippers	M		3.86	60.71	301.86	559 86			559 86	457 14

TABLE No. XXV.—LABOUR AND WAGES.—*Concluded.*

OCCUPATION OR SUB-OCCUPATION.	Unit of Workpeople— Over 16.	Under 16.	No of Dependents.	Hours employed per week.	Days employed per year.	Yearly wages from occupation.	Extra earnings.	Wife and children's earnings.	Total earnings.	Cost of living.
						$ c.	$ c.	$ c.	$ c.	$ c.
Ship carpenters	M		3.40	53.00	237.80	390 40		20 00	410 40	355 00
Shirt makers	F		....	60.00	300.00	196 50			196 50	159 00
Shoe fitters	"		.74	56.27	206.47	125 27			125 27	163 40
Shoemakers	M		2.66	58.34	280.55	412 09	17 23	33 00	462 32	354 18
Soap makers	"		4.33	59.67	304.00	483 67			483 67	416 67
Stokers	"		3.50	60.00	320.00	455 00			455 00	390 00
Stone cutters	"		3.00	57.40	224.00	482 00			482 00	430 00
Stove foundry employees:										
Assorters	"		1.67	59.33	241.33	284 00		20 00	304 00	209 00
Core makers	"		3.33	56.67	215.33	315 17			315 17	368 50
Finishers	"		2.56	59.33	256.11	381 56			381 56	369 78
Grinders	"		3.00	59.00	216.00	230 00	25 00		255 00	255 00
Melters	"		3.50	59.50	254.59	421 25			421 25	368 75
Mounters	"		1.63	59.21	249.00	337 68	16		337 84	301 37
Moulders	"		2.40	57.65	254.50	409 95	1 75	10 00	421 70	374 75
Polishers	"		3.33	59.00	208.00	400 00			400 00	383 33
Street car drivers	"		2.27	81.60	310.20	373 87			373 87	345 20
Tailors	"		2.00	57.10	225.87	366 97	1 29		368 26	327 87
Tailoresses	F		.32	58.41	250.66	191 43			191 43	183 36
Tanners	M		3.67	59.33	296.00	390 50			390 50	386 38
Teamsters	"		2.86	64.38	300.54	348 94	7 80	4 50	361 24	327 14
Telegraph operators	"		1.57	63.92	311.93	475 93	12 14		488 07	409 71
Tile makers	"		2.50	60.00	300.00	391 67			391 67	316 67
Tinsmiths	"		1.49	58.14	280.89	398 23	5 14		403 37	312 86
Trunk and tray liners	F		.60	66.00	290.00	177 60			177 60	241 20
Trunk makers	M		3.11	57.53	274.47	367 32			367 32	343 63
Turners (wood)	"		2.23	57.15	277.31	421 92	1 92	15 38	439 22	355 18
Waggon makers	"		2.70	56.40	274.90	411 00	2 00	5 00	418 00	365 50
Watchmen	"		2.80	72.20	341.60	429 00	20 00		449 00	360 00
Wheel makers	"		2.75	55.00	225.00	382 50			382 50	318 75
Whip makers	"		1.40	60.00	230.00	305 50			305 50	278 00
Woollen factory operatives:										
Burlers	F		....	59.00	262.50	152 50			152 50	152 50
Carders	M		3.50	60.00	275.00	425 00			425 00	425 00
Drawers-in	F		....	59.00	250.00	132 50			132 50	132 50
Drum tenders	"		....	59.00	275.00	175 00			175 00	150 00
Dyers	M		1.67	60.00	276.67	386 67			386 67	353 33
Finishers	"		.57	60.00	275.86	403 29	4 28		407 57	286 14
Loom fixers	"		1.50	59.50	275.00	456 00			456 00	387 50
Picker feeders	F		....	60.00	300.00	192 50			192 50	200 00
Reelers	"		.33	58.00	250.00	150 00	16 67	33 33	200 00	175 00
Spinners	M		....	60.00	283.33	363 33			363 33	266 67
Weavers	F		....	58.00	266.67	191 67			191 67	175 00

LABOUR AND WAGES.

TABLE No. XXVI.—Showing the aggregate and average of wages earned, time employed and cost of living of 2,853 workpeople in Toronto, Guelph, Stratford, London, Chatham, St. Thomas, Brantford, Galt, Dundas, Hamilton, St. Catharines, Merritton, Thorold, Oshawa, Belleville, Kingston, Brockville, Cornwall and Ottawa for the year ending October 31st, 1884.

SCHEDULE.	Male.				Female.				Total.	
	Over 16.		Under 16.		Over 16.		Under 16.			
	Aggregate.	Average.	Aggregate.	Average.	Aggregate.	Average.	Aggregate.	Average.	Aggregate.	Average.
Number of workers	2,565	.....	11	.....	264	.....	13	.....	2,853	.....
Number without dependents	750	.....	11	.....	220	.....	13	.....	994	.....
Number with dependents	1,815	.....	.....	.....	44	.....	.....	.....	1,859	.....
Number of dependents	6,125	3.37	.....	.....	87	1.98	.....	.....	6,212	3.34
Hours employed per week	151,453	59.05	682	62.00	15,701	59.47	786	60.46	168,622	59.10
Days employed in year	680,088	265.14	3,165	287.73	69,790	264.36	3,480	267.69	756,523	265.17
Yearly wages ....$	1,011,485	394.34	1,464	133.09	47,934	181.57	1,263	97.15	1,062,146	372.29
Extra earnings....$	12,199	4.76	5	.45	133	.50	.....	.....	12,337	4.33
Wife and children's earnings.$	18,774	7.32	.....	.....	320	1.21	.....	.....	19,094	6.69
Total earnings....$	1,042,458	406.42	1,469	133.54	48,387	183.28	1,263	97.15	1,093,577	383.31
Total earnings of workers—										
Without dependents....$	250,588	334.12	1,469	133.54	39,120	177.82	1,263	97.15	292,440	294.20
With dependents....$	791,870	436.29	.....	....	9,267	210.61	.....	.....	801,137	430.95
Cost of living to workers—										
Without dependents....$	189,205	252.27	1,528	138.91	36,595	166.34	1,403	107.92	228,731	230.11
With dependents....$	715,629	394.29	.....	.....	9,894	224.86	.....	.....	725,523	390.28
With and without depend'ts.$	904,834	352.76	1,528	138.91	46,489	176.09	1,403	107.92	954,254	334.47
*Surplus earnings of workers—										
Without dependents....$	61,383	81.84	-59	-537	2,525	11.48	-140	-10.77	63,709	64.09
With dependents....$	76,241	42.00	.....	.....	-627	-14.25	.....	.....	75,614	40.67
With and without depend'ts.$	137,624	53.66	-59	-537	1,898	7.19	-140	-10.77	139,323	48.84

NOTE.—In this table the number of dependents does not include the worker.

* Where the sign – is used it denotes a deficit.

LABOUR AND WAGES.

TABLE No. XXVII.—Showing the statistics of 2,853 workpeople whose earnings were more than, equal to and less than the cost of living for the year ending 31st October, 1884; also, the statistics of average, over average, and under average of time, earnings and cost of living of 2,853 workpeople for the year.

Earnings more than Cost of Living.	With Dependents.						Without Dependents.					With and without Dependents.				
	No. of Workers.	Average No. of dependents.	Average No. of days employed.	Average yearly earnings.	Average cost of living.	Surplus.	No. of workers.	Average No. of days employed.	Average yearly earnings.	Average cost of living.	Surplus.	No. of workers.	Average No of days employed.	Average yearly earnings.	Average cost of living.	Surplus.
				$ c.	$ c.	$ c.			$ c.	$ c.	$ c.			$ c.	$ c.	$ c.
$0 to $10	26	3.04	248.50	377 58	371 15	6 43	28	252.46	214 82	209 11	5 71	54	250.56	293 18	287 13	6 05
$10 to $20	46	3.22	271.48	416 47	398 49	17 98	25	244.60	248 54	231 72	16 82	71	262.01	357 34	339 77	17 57
$20 to $30	69	3.33	267.39	425 39	397 61	27 78	36	268.22	235 75	210 47	25 28	105	267.68	360 37	333 45	26 92
$30 to $40	43	3.12	268.77	435 37	397 93	37 44	21	265.23	253 07	219 05	34 02	64	267.61	375 55	339 23	36 32
$40 to $50	101	2.81	277.64	435 19	386 69	48 50	58	270.21	298 57	250 26	48 31	159	274.93	385 35	336 92	48 43
$50 to $75	101	3.36	282.17	457 68	391 53	66 15	57	270.14	329 37	261 18	68 19	158	277.83	411 39	344 50	66 89
$75 to $100....	100	3.02	285.48	506 44	412 97	93 47	75	278.15	364 46	269 12	95 34	175	282.34	445 59	351 32	94 27
$100 to $150....	123	2.97	285.82	519 13	382 92	136 21	78	282 12	393 36	260 12	133 24	201	284.39	470 32	335 26	135 06
$150 to $200....	80	2.80	291.09	577 81	395 98	181 83	76	286.14	443 29	259 06	184 23	156	288.68	499 46	329 27	170 19
$200 to $300....	73	3.32	285.73	655 38	403 89	251 49	75	288.95	503 60	254 92	248 68	148	287.36	578 47	328 40	250 07
$300 to $400....	16	4.06	286.63	856 63	507 13	349 50	15	280.00	645 87	281 07	364 80	31	283.42	754 65	397 74	356 91
$400 to $500....	9	3.00	275.89	909 45	453 33	456 12	3	284.67	697 67	235 33	462 34	12	278.08	856 50	398 83	457 67
Over $500	7	2.57	314.00	1144 14	527 14	617 00	1	313.00	1200 00	600 00	600 00	8	313.87	1151 12	536 25	614 87
Total.....	794	3.09	280.37	510 95	398 70	112 25	548	275.77	373 32	251 88	121 44	1342	278 49	454 75	338 75	116 00
Earnings equal to Cost of Living.....	884	3.47	258 78	385 86	385 86	....	381	265.47	205 39	205 39	.....	1265	260.79	331 51	331 51	.....
Earnings less than Cost of Living:						Deficit.					Deficit.					Deficit.
$0 to $10	14	3.36	252.50	359 39	365 71	6 32	11	262.18	216 60	222 27	5 67	25	256.76	296 56	302 60	6 04
$10 to $20	14	3.29	217.93	338 61	354 50	15 89	7	220.29	198 06	215 28	17 22	21	218.71	291 76	308 10	16 34
$20 to $30	31	3.81	221.94	328 26	355 06	26 80	7	219.43	147 87	172 57	24 70	38	221.47	295 03	321 45	26 42
$30 to $40	12	3.33	210.75	335 83	374 75	38 92	7	251.00	125 86	164 14	38 28	19	225.58	258 47	297 16	38 69
$40 to $50	25	4.24	234.64	338 39	386 32	47 93	11	237.82	150 91	198 64	47 73	36	235 61	281 10	328 97	47 87
$50 to $75	16	3.63	209.31	274 86	340 81	65 95	15	237.60	93 13	156 13	63 00	31	223.00	186 93	251 45	64 52
$75 to $100....	28	3.82	182.86	283 36	375 21	91 85	3	138.33	174 17	266 67	92 50	31	178.55	272 79	364 71	91 92
$100 to $150....	20	4.30	193.30	259 10	382 65	123 55	4	153.75	85 38	202 50	117 12	24	186.71	230 15	352 63	122 48
$150 to $200....	7	2.86	184.00	204 06	382 00	177 94	....	.....	.....	.....	.....	7	184.00	204 06	382 00	177 94
$200 to $300.....	12	4.08	170.08	199 55	418 58	219 03	....	.....	.....	.....	.....	12	170.08	199 55	418 58	219 03
$300 to $400....	2	7.00	210.00	285 00	650 00	365 00	....	.....	.....	.....	.....	2	210.00	285 00	650 00	365 00
Total.....	181	3.82	209 64	300 25	374 88	74 63	65	229.82	147 79	191 48	43 69	246	214.97	259 96	326 42	66 46
						Surplus.					Surplus.					Surplus.
Average	1859	3.34	263.22	430 95	390 28	40 67	994	268.81	294 20	230 11	64 09	2853	265.17	383 31	334 47	48 84
Over average ...	610	3.06	284.69	536 28	400 07	136 21	352	282.19	433 68	263 96	169 72	1005	283.35	489 28	342 72	146 56
Under average..	1249	3.48	252.73	378 30	385 49	– 7 19	642	261.49	217 73	211 55	6 18	1848	255.28	325 68	329 99	– 4 31

Note.—In this table the number of dependents does not include the worker.

MARKET

TABLE XXVIII.—Showing the average prices of Agricultural and Animal Products at Toronto and Montreal; also, the half-yearly and yearly averages for

MARKETS.	January.		February.		March.		April.		May.		June.	
	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
TORONTO PRODUCE MARKET.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Flour, Sup. Ex., per bbl	5 02	4 31	5 07	4 59	5 08	4 55	5 02	4 52	5 13	4 72	5 07	4 67
" Extra "	4 76	4 21	4 67	4 48	4 64	4 44	4 63	4 42	4 64	4 61	4 69	4 56
Fall Wheat...per bush.	1 06	94	1 05	1 03	1 05	1 01	1 06	1 01	1 12	1 06	1 12	1 07
Spring Wheat. "	1 10	96	1 10	1 05	1 09	1 07	1 08	1 08	1 13	1 08	1 13	1 08
Barley..... "	62	64	62	65	62	66	69	64	65	63	.....	55
Oats ..... "	32	42	33	42	36	44	38	46	41	46	41	45
Peas..... "	74	73	73	75	73	77	73	78	76	80	75	80
Rye ..... "	62	60	62	60	61	65	62	66	65	67	65	67
Potatoes ..... per bag	73	67	69	66	69	67	68	66	74	65	72	59
Apples..... per bbl	3 35	3 23	3 33	2 91	3 78	3 04	3 75	3 46	3 75	3 58	4 00	.....
Hogs..... per cwt	7 26	8 18	7 95	8 05	8 44	8 23	7 85	8 59	8 23	9 38	8 21	9 13
Butter..... per lb.	16	18	16	18	16	18	17	21	16	17	14	15
Eggs..... per doz	23	23	28	25	20	20	16	17	16	15	15	16
Wool (coarse).. per lb.	19	19	18	19	19	19	19	19	18	19	17	19
" (fine).... "	25	30	25	30	27	30	26	27	25	29	25	29
TORONTO STREET MARKET.												
Fall Wheat....per bush	1 04	94	1 04	1 01	1 04	1 00	1 01	98	1 09	1 04	1 08	1 05
Spring Wheat. "	1 09	95	1 11	1 04	1 10	1 07	1 09	1 06	1 13	1 09	1 12	1 08
Barley... .... "	63	64	63	65	65	66	71	64	64	61	62	56
Oats ..... "	35	42	37	44	39	47	41	48	43	49	43	48
Peas..... "	74	71	74	74	76	76	75	78	75	78	74	75
Rye ..... "	62	60	62	60	60	61	61	63	62	63	62	.....
Potatoes ..... per bag	89	72	87	75	84	77	83	80	83	78	83	70
Apples..... per bbl.	2 57	2 36	.....	2 52	3 50	2 67	3 50	3 07	3 50	2 86	.....	2 50
Hay ..... per ton.	10 55	13 59	11 40	13 14	11 19	15 02	11 81	15 54	10 93	15 35	10 58	13 66
Hogs..... per cwt	7 38	8 23	8 20	8 13	8 44	8 19	7 94	8 58	8 23	9 25	8 16	9 02
Butter (rolls) .. per lb.	22	24	23	25	23	26	25	25	22	22	16	18
" (dairy).. "	19	19	18	19	18	22	19	22	18	21	14	.....
Beef (hind-qrs). per cwt	8 32	7 38	7 70	8 00	7 99	8 29	9 39	8 50	9 69	8 50	9 68	.....
" (fore-qrs). "	5 93	5 38	6 00	5 88	6 36	6 18	7 14	6 50	7 25	6 50	6 58	.....
Mutton ..... "	7 50	7 66	7 38	7 63	7 79	8 96	8 99	9 50	9 42	9 50	8 66	.....
Lamb..... "	8 73	9 32	8 70	9 00	9 29	10 46	10 29	11 00	10 92	11 00	11 75	.....
LONDON.												
Fall Wheat....per bush	99	92	1 01	1 00	1 01	1 00	1 04	1 00	1 05	1 06	1 08	1 08
Spring Wheat. "	1 02	90	1 08	.....	1 10	.....	1 14	.....	1 11	.....	1 08	.....
Barley..... "	52	54	52	54	53	56	55	61	55	60	55	54
Oats..... "	35	38	35	40	37	42	39	45	39	44	40	44
Peas..... "	78	67	78	67	80	72	83	77	80	77	81	74
GUELPH.												
Fall Wheat....per bush	1 06	91	1 04	98	1 08	99	1 07	97	1 09	1 00	1 11	1 05
Spring Wheat. "	1 05	92	99	97	1 01	1 00	1 01	98	1 01	1 01	1 01	1 07
Barley..... "	56	50	57	50	56	50	57	50	65	50	57	48
Oats..... "	30	37	31	40	34	42	36	43	37	45	38	43
Peas..... "	68	68	68	70	72	74	74	74	74	74	73	70
BRANTFORD.												
Fall Wheat....per bush	1 04	89	1 02	96	1 03	1 00	1 03	99	1 04	1 00	1 04	1 02
Spring Wheat. "	1 04	97	1 04	97	1 05	1 01	1 05	1 02	1 05	1 01	1 05	1 02
Barley..... "	55	54	54	64	54	61	55	61	59	59	58	53
Oats..... "	32	36	33	37	34	41	36	43	39	43	39	43
Peas..... .... "	68	64	73	68	73	69	73	72	75	71	71	68

PRICES.

the leading markets of Ontario for each month, together with the Live Stock Markets of each market, and for the whole Province in the years 1883 and 1884.

July.		August.		September.		October.		November.		December.		1st ½-year.		2nd ½-year.		The year.	
1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
5 04	4 69	4 87	4 93	4 02	5 21	3 76	5 26	3 53	5 17	3 44	5 08	5 06	4 56	4 10	5 06	4 56	4 82
4 76	4 58	4 62	4 81	3 83	5 06	3 56	5 09	3 35	4 98	.....	4 84	4 67	4 45	4 06	4 90	4 39	4 68
1 06	1 05	94	1 09	79	1 14	78	1 10	74	1 09	73	1 09	1 08	1 02	84	1 09	96	1 06
1 09	1 07	97	1 12	85	1 15	81	1 11	72	1 12	73	1 14	1 11	1 05	86	1 12	98	1 09
.....	46	.....	66	61	67	61	63	62	64	58	62	63	63	61	64	62	63
40	42	40	40	37	38	32	39	33	36	31	34	37	44	35	38	36	41
74	80	74	79	65	.....	61	73	59	74	58	75	74	77	64	76	70	77
62	61	61	56	62	60	58	61	58	62	56	62	63	66	59	61	61	65
78	75	67	98	49	97	46	85	37	79	37	76	71	65	50	85	61	74
4 00	.....	2 08	2 88	2 05	2 65	1 63	2 46	1 88	2 93	1 91	3 47	3 63	3 24	1 92	2 80	2 61	2 96
8 18	8 43	8 22	8 36	7 75	8 53	6 90	7 15	5 91	5 70	5 64	5 82	7 97	8 31	6 27	6 83	7 44	7 70
14	15	15	14	16	14	18	14	16	16	15	17	16	18	16	15	16	16
16	16	16	16	16	16	19	21	20	23	22	24	20	19	18	20	19	19
17	19	17	19	18	20	17	20	17	20	17	21	18	19	17	20	18	19
24	28	24	27	23	26	24	27	23	27	23	27	26	29	23	27	24	28
1 00	1 04	93	1 08	83	1 09	78	1 03	73	1 05	73	1 08	1 05	1 00	83	1 06	94	1 03
1 04	1 05	93	1 12	87	1 12	79	1 09	73	1 10	71	1 15	1 11	1 05	84	1 11	97	1 08
.....	55	.....	.....	60	65	60	62	61	64	58	62	65	64	60	63	63	63
44	46	44	44	38	41	34	38	33	37	32	37	40	46	37	40	38	43
73	77	74	.....	67	73	61	74	58	74	57	75	74	75	63	76	69	75
61	.....	61	.....	64	60	60	63	59	63	56	63	62	61	60	63	61	62
91	84	68	99	53	1 05	52	94	47	88	45	88	85	75	60	93	73	84
.....	.....	.....	3 38	1 99	.....	1 29	2 31	1 17	.....	1 39	.....	3 28	2 68	1 43	2 63	2 12	2 67
11 95	12 71	10 64	10 83	11 79	11 71	11 79	10 34	11 64	9 86	10 77	9 01	10 99	14 38	11 44	10 79	11 39	12 55
8 17	8 73	8 22	8 53	7 91	8 38	7 06	7 15	6 09	6 14	5 97	5 97	8 06	8 56	7 22	6 97	7 62	7 92
17	19	19	18	22	18	23	21	22	21	22	21	22	23	21	20	21	21
14	.....	15	17	18	.....	18	14	18	16	17	16	18	21	17	16	17	18
9 22	.....	8 33	.....	8 00	.....	7 87	.....	6 16	.....	6 16	.....	8 77	8 10	7 59	.....	8 14	8 10
6 04	.....	5 39	.....	5 45	.....	5 06	.....	4 57	.....	4 86	.....	6 55	6 06	5 42	.....	5 95	6 06
7 78	.....	6 16	.....	6 17	.....	5 98	.....	5 45	.....	5 11	.....	8 31	8 68	6 07	.....	7 11	8 68
8 25	.....	7 84	.....	7 19	.....	6 82	.....	6 27	.....	6 11	.....	9 76	10 20	6 85	.....	8 21	10 20
99	1 00	87	1 00	77	1 05	74	1 01	72	1 05	70	1 01	1 03	1 02	80	1 02	91	1 02
05	....	89	96	76	.....	74	.....	73	1 06	72	1 03	1 09	90	82	1 04	95	1 01
54	51	54	51	55	52	51	53	50	52	51	52	54	57	53	52	53	54
40	44	39	41	31	36	27	35	28	35	28	35	37	42	32	39	35	41
76	71	73	73	64	74	62	76	58	78	55	78	81	73	65	74	73	73
99	1 03	90	1 04	78	1 07	76	1 09	73	1 09	71	1 11	1 08	98	81	1 07	94	1 03
96	1 03	90	1 05	78	1 08	76	1 10	73	1 10	71	1 11	1 01	99	81	1 08	91	1 04
52	48	54	50	53	55	51	56	52	61	54	59	58	50	53	55	55	52
37	42	38	41	35	39	29	34	29	31	28	31	34	42	33	36	34	39
68	70	68	70	66	68	61	68	57	69	56	70	72	72	62	69	67	70
1 00	1 05	86	1 03	77	1 05	74	1 06	71	1 00	71	1 04	1 03	98	80	1 04	92	1 00
1 00	1 05	89	1 06	79	1 08	74	1 09	73	1 03	71	1 05	1 05	1 00	82	1 06	93	1 02
53	53	53	53	53	52	50	55	51	54	50	55	56	58	52	53	54	57
38	42	37	41	31	32	29	32	27	32	27	32	35	41	31	36	33	39
68	68	60	68	59	64	60	64	55	64	55	66	72	68	59	66	65	68

MARKET

TABLE XXVIII.—Showing the average prices of Agricultural and Animal

Markets.	January.		February.		March.		April.		May.		June.	
	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
St. Thomas.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Fall Wheat ...per bush	1 06	96	99	99	99	1 00	99	1 00	99	1 05	1 02	1 05
Spring Wheat. "	.....	91	.....	97	.....	1 00	.....	1 00	.....	1 03	.....	1 00
Barley..... "	65	75	65	65	65	65	65	65	65	60	63	69
Oats..... "	37	35	38	39	38	40	38	40	38	44	39	40
Peas..... "	90	75	90	75	90	75	90	75	90	68	88	75
Lindsay.												
Fall Wheat....per bush	94	86	90	92	91	92	95	92	96	98	98	97
Spring Wheat. "	1 00	87	97	94	96	95	97	94	98	98	99	97
Barley..... "	54	51	53	55	53	55	53	53	53	51	53	50
Oats..... "	29	37	30	37	31	39	35	44	36	49	36	42
Peas..... .... "	72	70	72	73	72	73	75	67	75	78	71	76
Belleville.												
Barley.....per bush	55	60	55	60	55	60	60	58	65	58	63	.....
Peas..... . "	70	73	70	73	71	71	71	72	71	72	71	.....
Kingston.												
Barley.....per bush	48	61	57	67	57	65	58	62	62	64	62	.....
Peas..... "	75	73	77	76	78	77	78	79	78	78	77	.....
Ottawa.												
Rye.....per bush	55	.....	55	.....	55	.....	55	.....	55	80	55	.....
Peas..... "	.....	74	70	75	70	73	70	73	70	79	80	.....
Chatham.												
Beans.....per bush	1 30	1 64	1 35	1 74	1 38	1 71	1 38	1 55	1 30	1 30	1 60	1 38
Corn..... "	68	44	70	48	.....	50	.....	49	.....	50	74	52
Ridgetown.												
Beans.....per bush	1 21	1 60	1 28	1 67	1 43	1 55	1 50	1 35	.....	1 40	.....	1 33
Corn..... "	79	49	78	50	77	55	75	55	.....	55	70	50
Average Prices for the Province.												
Fall Wheat....per bush	1 03	92	1 02	99	1 03	1 00	1 03	99	1 05	1 02	1 07	1 05
Spring Wheat. "	1 05	94	1 05	99	1 06	1 02	1 07	1 01	1 07	1 03	1 06	1 04
Barley..... "	57	60	57	61	58	60	60	60	61	58	58	54
Oats..... "	33	37	34	40	36	42	38	44	39	45	40	44
Peas..... "	74	71	74	73	77	73	77	75	80	76	76	72
Rye .... "	61	60	61	60	60	61	60	63	61	63	61	.....
Corn..... "	72	45	73	48	77	52	75	51	.....	52	74	51
Beans ..... "	1 27	1 63	1 32	1 72	1 40	1 65	1 44	1 48	1 30	1 35	1 60	1 35
LIVE STOCK MARKETS.												
Toronto.												
Cattle .....per cwt.	4 34	4 36	4 63	4 44	4 19	5 05	4 88	4 82	5 00	5 48	5 00	5 84
Sheep..... each	4 50	4 75	4 56	4 56	4 97	.....	5 13	5 60	5 25	6 71	5 17	5 79
Lambs..... "	5 25	5 12	5 09	5 38	5 38	.....	5 50	6 00	5 63	5 06	5 33	4 07
Hogs.....per cwt.	6 08	6 25	6 06	6 29	6 16	6 56	6 00	6 66	6 00	7 68	6 17	7 00
Montreal.												
Cattle .....per cwt.	4 55	4 33	5 23	4 41	5 27	5 00	5 39	5 63	5 65	5 75	5 70	6 06
Calves .... each	4 50	4 42	7 46	6 50	7 92	7 38	6 54	6 17	6 35	6 35	6 13	.....
Sheep.....per cwt.	5 43	6 03	5 96	5 85	6 79	6 13	6 54	7 50	6 10	6 80	5 50	9 00
Lambs.....each	3 56	3 98	.....	4 08	4 85	5 00	4 41	4 00	3 55	4 00	3 25	3 50
Hogs.....per cwt.	6 03	6 50	6 50	7 29	6 68	7 06	6 88	8 00	6 68	8 13	6 22	8 00

PRICES.—*Continued.*

Products at the leading markets of Ontario for each month, etc.—*Concluded.*

July.		August.		September.		October.		November.		December.		1st ½-year.		2nd ½-year.		The year.	
1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
97	1 05	90	1 05	78	1 04	71	1 06	67	1 06	67	1 08	1 01	1 00	78	1 05	89	1 02
97	1 00	90	1 00	78	1 04	71	1 03	67	1 06	67	1 13	.....	99	78	1 01	.....	1 00
65	69	62	69	.....	60	48	60	47	60	45	60	65	67	52	65	59	66
44	40	39	40	31	36	27	33	25	34	25	35	38	39	31	37	35	39
90	75	76	75	62	61	60	63	60	66	60	70	90	75	67	70	78	73
97	92	93	1 01	77	1 02	73	95	67	97	67	98	94	93	79	97	86	95
99	92	96	1 01	79	1 02	76	98	68	1 02	67	1 06	98	94	81	1 00	89	97
51	50	50	51	49	52	52	52	52	53	48	55	53	53	52	52	52	52
37	39	38	38	31	38	29	33	26	31	27	32	33	41	31	35	32	38
83	64	65	60	64	60	55	61	55	63	53	64	73	73	61	62	67	67
63	56	.....	57	.....	57	58	61	57	64	54	57	57	59	57	59	57	59
71	73	.....	73	.....	73	55	73	55	73	55	72	71	72	56	72	64	72
59	55	.....	53	58	55	58	59	54	55	52	55	55	63	55	55	55	62
76	73	.....	73	72	73	66	79	57	78	58	76	76	77	64	75	71	76
60	53	60	.....	60	60	63	59	50	64	54	53	55	80	60	58	57	60
78	85	80	.....	80	75	80	74	59	73	59	71	72	75	77	73	75	74
1 50	1 16	1 50	1 13	1 41	1 19	93	1 72	96	1 91	89	1 24	1 38	1 60	1 21	1 39	1 30	1 49
73	51	73	54	73	58	73	57	66	59	74	64	70	48	72	56	71	52
.....	1 13	.....	.....	.....	.....	87	.....	90	1 63	.....	1 41	1 35	1 48	89	1 41	1 23	1 46
.....	52	.....	56	.....	56	.....	65	.....	67	.....	94	76	53	.....	67	76	60
99	1 03	89	1 04	78	1 06	75	1 05	71	1 05	70	1 07	1 04	99	80	1 05	92	1 02
1 01	1 03	90	1 05	80	1 08	75	1 09	72	1 08	71	1 10	1 06	1 01	81	1 07	93	1 04
55	54	54	55	55	57	53	58	53	60	52	58	58	59	54	57	56	58
40	43	40	41	33	38	29	35	29	34	28	34	37	42	33	38	35	40
74	71	71	71	66	68	64	70	57	71	57	72	76	73	64	71	70	72
61	53	60	.....	62	60	61	61	58	63	56	61	61	61	60	62	60	61
73	51	73	55	73	57	73	59	66	62	74	79	73	50	72	59	73	55
1 50	1 15	1 50	1 13	1 41	1 19	91	1 72	93	1 81	89	1 31	1 37	1 55	1 15	1 39	1 28	1 48
5 02	5 84	4 43	5 07	4 03	4 60	4 04	4 46	3 59	4 06	4 22	4 13	4 58	5 10	4 04	4 83	4 31	4 97
4 43	5 63	4 16	6 38	4 00	.....	3 71	4 21	3 45	4 38	3 82	.....	4 88	5 52	3 86	5 32	4 19	5 44
5 21	4 30	.....	3 68	.....	3 69	.....	3 47	3 04	3 78	3 81	3 92	5 31	4 95	3 70	3 81	4 51	4 27
6 13	....	5 88	5 88	5 78	5 78	4 93	5 35	4 54	4 91	4 33	4 50	6 10	6 81	5 42	5 26	5 67	6 11
4 72	5 25	4 11	4 43	4 25	4 68	4 50	4 15	4 29	4 25	4 73	4 36	5 25	4 93	4 42	4 50	4 92	4 70
5 75	7 88	5 80	7 00	8 00	6 50	.....	.....	7 50	9 50	8 00	8 80	6 89	6 26	6 40	7 90	6 76	6 99
4 50	.....	4 50	4 56	4 25	5 08	4 25	5 25	4 03	5 80	4 40	6 07	6 10	6 36	4 29	5 47	5 49	2 94
3 41	3 34	2 94	3 06	3 38	2 75	3 25	3 78	3 08	3 41	3 54	3 38	4 00	4 16	3 23	3 25	3 59	3 64
6 34	6 91	6 52	6 54	6 06	6 47	5 81	5 85	5 05	5 44	4 78	5 31	6 52	7 40	5 83	6 19	6 23	6 57

MARKET PRICES.

TABLE No. XXIX.—Showing the average prices of Wheat, Barley, Oats,

FALL WHEAT.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	1st Half-year.	2nd Half-year.	Year.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1870	85	84	91	93	1 05	1 14	1 21	1 24	1 15	1 16	1 20	1 20	94	1 19	1 06
1871	1 26	1 38	1 37	1 45	1 41	1 32	1 24	1 06	1 18	1 33	1 31	1 28	1 36	1 23	1 29
1872	1 27	1 28	1 26	1 31	1 48	1 49	1 35	1 45	1 37	1 31	1 29	1 28	1 35	1 34	1 35
1873	1 32	1 39	1 39	1 35	1 38	1 26	1 24	1 28	1 29	1 27	1 22	1 24	1 36	1 25	1 30
1874	1 28	1 27	1 29	1 30	1 32	1 35	1 31	1 21	1 09	1 05	1 00	99	1 31	1 11	1 20
1875	99	96	93	97	1 01	1 00	1 13	1 24	1 15	1 09	1 05	1 02	97	1 11	1 05
1876	1 00	1 01	1 03	1 07	1 09	1 10	1 04	1 00	1 10	1 14	1 14	1 24	1 05	1 11	1 08
1877	1 36	1 46	1 49	1 62	1 89	1 65	1 60	1 25	1 23	1 21	1 21	1 20	1 60	1 28	1 43
1878	1 23	1 20	1 19	1 19	1 09	1 09	86	87	88	1 00	1 06	1 03	1 17	95	1 05
1879	89	91	98	99	1 00	1 00	1 06	1 04	1 06	1 21	1 23	1 30	96	1 15	1 05
1880	1 28	1 28	1 29	1 25	1 23	1 12	1 08	1 07	99	1 04	1 10	1 12	1 24	1 07	1 15
1881	1 09	1 09	1 10	1 12	1 14	1 19	1 24	1 25	1 31	1 35	1 29	1 25	1 12	1 28	1 20
1882	1 22	1 26	1 26	1 31	1 32	1 28	1 24	1 14	1 05	99	94	91	1 27	1 05	1 16
1883	94	1 03	1 01	1 01	1 06	1 07	1 05	1 09	1 14	1 10	1 09	1 09	1 02	1 09	1 06
1884	1 06	1 05	1 05	1 06	1 12	1 12	1 06	94	79	78	74	73	1 08	84	96

SPRING WHEAT.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	1st Half-year.	2nd Half-year.	Year.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1870	82	81	85	87	96	1 10	1 19	1 14	1 05	1 09	1 12	1 14	89	1 12	98
1871	1 19	1 33	1 37	1 39	1 36	1 26	1 17	1 07	1 14	1 23	1 23	1 19	1 32	1 17	1 23
1872	1 22	1 21	1 19	1 24	1 40	1 40	1 30	1 35	1 34	1 23	1 19	1 18	1 28	1 26	1 27
1873	1 22	1 23	1 24	1 29	1 30	1 24	1 24	1 26	1 25	1 18	1 13	1 14	1 26	1 20	1 23
1874	1 17	1 17	1 18	1 24	1 29	1 24	1 22	1 23	1 12	97	94	95	1 21	1 07	1 13
1875	93	89	89	95	99	98	1 08	1 23	1 13	1 09	1 04	99	94	1 09	1 02
1876	97	98	1 01	1 03	1 05	1 07	1 02	99	1 04	1 05	1 10	1 18	1 02	1 06	1 04
1877	1 28	1 35	1 37	1 53	1 79	1 55	1 53	1 23	1 17	1 14	1 11	1 12	1 50	1 22	1 35
1878	1 07	1 03	1 05	1 12	1 10	98	83	81	82	95	1 02	1 03	1 06	91	98
1879	80	81	91	92	94	95	1 03	99	1 02	1 17	1 20	1 26	89	1 11	1 00
1880	1 25	1 26	1 28	1 26	1 25	1 26	1 09	1 20	1 09	1 09	1 14	1 16	1 24	1 13	1 19
1881	1 15	1 16	1 18	1 16	1 17	1 16	1 24	1 26	1 32	1 37	1 33	1 32	1 17	1 31	1 24
1882	1 31	1 29	1 27	1 34	1 35	1 34	1 30	1 19	1 13	1 01	98	93	1 32	1 11	1 22
1883	96	1 05	1 07	1 08	1 08	1 08	1 07	1 12	1 15	1 11	1 12	1 14	1 05	1 12	1 09
1884	1 10	1 10	1 09	1 08	1 13	1 13	1 09	97	85	81	72	73	1 11	86	98

BARLEY.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	1st Half-year.	2nd Half-year.	Year.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
1870	55	50	50	51	54	59	63	64	75	66	62	58	53	65	58
1871	60	61	65	65	60	60	63	58	58	57	61	64	64	60	62
1872	64	64	63	65	65	59	56	59	64	68	66	61	63	63	63
1873	64	67	66	71	67	53	53	64	94	1 16	1 13	1 17	65	93	81
1874	1 24	1 44	1 39	1 29	1 08	75	74	87	86	98	1 11	1 11	1 25	96	1 09
1875	1 09	1 01	85	1 00	99	.....	.....	83	87	84	81	79	99	83	90
1876	77	76	70	73	73	.....	.....	58	66	77	78	76	73	69	71
1877	75	75	70	71	70	62	61	61	58	58	60	62	70	60	65
1878	60	59	56	52	53	52	85	76	77	54	86	1 02	56	79	67
1879	76	72	66	63	56	53	53	51	52	60	61	61	64	56	60
1880	62	62	62	62	63	63	58	59	62	66	83	93	62	73	68
1881	86	89	91	87	82	90	.....	75	83	88	86	85	87	84	86
1882	87	83	85	88	89	85	.....	72	68	70	62	63	86	70	80
1883	64	65	66	64	63	55	46	66	67	63	64	62	63	64	63
1884	62	62	62	69	65	.....	.....	.....	61	61	62	58	63	61	62

MARKET PRICES.

Rye, and Peas on the Toronto Produce Market for the fifteen years, 1870–1884.

OATS.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	1st Half-year.	2nd Half-year.	Year.
	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.
1870	31	33	34	36	38	40	42	41	39	38	43	44	35	41	37
1871	45	53	55	52	48	49	51	45	37	38	40	44	50	43	46
1872	43	42	42	41	42	39	37	38	39	39	41	39	42	39	40
1873	41	41	40	39	41	40	39	40	39	40	40	39	41	39	40
1874	38	40	44	47	55	52	55	52	40	40	42	42	46	45	46
1875	44	45	45	46	52	48	45	44	40	37	35	33	46	39	42
1876	34	33	34	35	36	33	33	33	34	37	42	41	34	37	35
1877	43	45	44	43	51	51	49	44	35	34	34	34	47	38	42
1878	35	34	35	35	34	32	29	30	29	31	32	28	34	30	32
1879	29	28	34	37	38	39	39	39	34	34	35	36	34	36	35
1880	37	37	37	37	37	37	37	37	34	32	34	34	37	35	36
1881	34	36	37	39	39	38	39	42	41	42	44	43	37	42	40
1882	41	41	41	45	47	48	49	47	46	41	40	38	44	46	45
1883	42	42	44	46	46	45	42	40	38	39	36	34	44	38	41
1884	32	33	36	38	41	41	40	40	37	32	33	31	37	35	36

RYE.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	1st Half-year.	2nd Half-year.	Year.
	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.
1870	51	53	55	55	54	70	68	60	67	70	70	70	59	68	63
1871	70	71	74	80	78	75	69	66	60	63	70	72	75	67	70
1872	68	68	11	71	71	71	.....	.....	.....	.....	65	65	70	65	69
1873	65	66	65	67	67	67	67	67	67	66	68	70	66	67	67
1874	70	70	70	73	80	80	76	.....	70	70	71	70	67	72	69
1875	70	71	71	71	72	74	74	74	74	65	60	60	71	67	79
1876	60	60	60	60	60	60	60	60	60	60	60	...	60	60	60
1877	65	.....	.....	.....	65	65	65	65	64	60	61	60	65	62	63
1878	60	.....	.....	.....	52	.....	56	56	50	.....	.....	56	56	55	56
1879	50	49	48	.....	.....	.....	52	51	50	63	69	72	50	62	58
1880	78	80	81	82	82	78	78	64	68	84	89	86	80	83	82
1881	82	85	86	95	95	83	71	93	95	96	91	86	88	90	89
1882	85	82	81	83	79	78	.....	66	65	64	60	60	82	62	70
1883	60	60	65	66	67	67	61	56	60	61	62	62	66	61	65
1884	62	62	61	62	65	65	62	61	62	58	58	56	63	59	61

PEAS.

Year.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	1st Half-year.	2nd Half-year.	Year.
	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.
1870	55	55	58	61	65	73	80	78	67	70	70	66	60	72	65
1871	69	79	88	90	88	82	73	69	60	71	69	66	83	68	74
1872	65	70	69	71	75	74	63	63	63	68	69	66	70	65	68
1873	66	66	68	69	69	62	65	68	68	60	61	61	67	63	65
1874	64	70	70	68	72	73	76	.....	71	82	82	81	70	84	74
1875	77	76	77	83	89	85	86	.....	75	74	74	74	81	75	79
1876	74	73	70	76	74	76	75	74	72	75	73	74	74	74	74
1877	75	77	77	82	96	82	81	79	71	73	66	65	82	72	77
1878	65	63	65	70	72	65	64	59	58	61	70	64	66	61	64
1879	60	58	62	67	68	66	64	64	61	65	65	67	64	65	64
1880	67	67	70	71	73	70	69	55	66	66	69	69	70	68	69
1881	67	67	69	75	76	75	75	76	77	80	79	79	72	78	75
1882	79	79	79	83	86	86	87	89	81	75	74	73	82	79	80
1883	73	75	77	78	80	80	80	79	....	73	74	75	77	76	77
1884	74	73	73	73	76	75	74	74	65	61	59	58	74	64	70

VALUES.

TABLE No. XXX.—Showing by County Municipalities and groups of Counties the Prices for the Province in the second half of each year; also the average

COUNTIES.	Fall Wheat.		Spring Wheat.		Barley.		Oats.	
	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
	$	$	$	$	$	$	$	$
Essex	477,632	465,542	39,006	22,051	37,883	28,767	400,370	328,181
Kent	1,076,451	688,978	48,693	14,446	77,908	78 287	472,199	437,137
Elgin	652,158	606,616	36,251	10,643	75,158	49,876	469,889	403,607
Norfolk	571,316	308,354	16,920	10,015	104,024	95,265	339,563	378,085
Haldimand	532,616	235,659	59,016	33,250	203,225	157,479	267,134	264,630
Welland	358,395	192,755	47,000	16,809	80,649	54,918	246.537	236,998
Totals	3,668,568	2,497,904	246,886	107,214	578,847	464,592	2,195,692	2,048,638
Lambton	490,279	377,275	135,547	57,487	215,224	178,211	617,035	438,060
Huron	1,242,028	619,991	522,272	254,121	392,532	521,589	883,127	1,142,497
Bruce	834,189	550,760	252,510	204,728	242,359	314,927	533,399	779,531
Totals	2,566,496	1,548,026	910,329	516,336	850,115	1,014,727	2,033,561	2,360,088
Grey	352,846	335,523	791,130	991,469	315,558	350,931	787,337	1,024,249
Simcoe	1,093,217	709,041	610,067	556,318	449,786	429,401	706,267	788,216
Totals	1,446,063	1,044,564	1,401,197	1,547,787	765,344	780,332	1,493,604	1,812,465
Middlesex	1,281,012	969,816	368,124	81,014	221,704	219,289	972,076	1,067,842
Oxford	757,588	377,575	377,555	159,582	250,084	335,678	672.043	875,078
Brant	653,084	367,813	31,537	16,678	224,063	196,308	277,384	254,468
Perth	867,957	365,503	488,145	269,331	315,711	352,476	734,522	833,612
Wellington	456,836	456,088	507,243	371,532	565,255	471,830	739,895	851,311
Waterloo	802,987	491,683	161,105	96,080	241,420	284,319	417,566	524,003
Dufferin	181,553	212,638	311,812	328,681	159,043	112,418	282,135	322,887
Totals	5,001,017	3,241,116	2,245,521	1,322,898	1,977,280	1,972,318	4,095,621	4,729,201
Lincoln	375,240	188,575	73,839	22,149	77,074	60,445	232,163	231,034
Wentworth	689,400	477,041	84,137	28,147	180,874	170,913	434,196	407,507
Halton	483,885	343,559	89,658	52,347	177,049	172,610	225,177	249,361
Peel	603,048	471,515	283,948	266,540	447,474	395,919	344,144	400,377
York	859,428	636,998	620,423	503,427	818,361	704,087	845,734	867,153
Ontario	204,642	257,319	992,285	941,314	498,548	499,430	627,889	695,500
Durham	32,622	83,308	820,776	892,206	609,152	547,314	425,736	453,584
Northumberland	148,293	199,749	531,662	535,617	562,221	519,149	332,718	366,840
Prince Edward	28,673	41,807	131,863	121,738	445,022	519,886	161,378	127,987
Totals	3,425,231	2,699,871	3,628,591	3,363,485	3,815,775	3,589,753	3.629,135	3,799,343
Lennox and Addington	27,041	46,801	120,622	107,458	459,634	527,491	189,603	212,906
Frontenac	30,550	53,183	143,723	138,401	200,314	283,884	249,144	312,962
Leeds and Grenville	73,017	141,179	241,480	210,528	151,549	176,927	780,436	699,178
Dundas	8,165	51,350	85,485	69,192	133,780	146,292	342,012	337,331
Stormont	12,678	17,060	71,694	73,530	34,656	50,731	287,646	318,463
Glengarry	7,203	14,633	110,771	112,179	26,571	30,973	317,218	380,701
Prescott	728	399	127,119	115,826	35,903	25,892	309,688	268,533
Russell	4,429	7,309	83,705	72,346	21,597	19,052	236,687	238,309
Carleton	5,655	69,088	441,984	334,494	128,722	91,914	768,683	742,580
Renfrew	6,007	61,351	387,064	504,193	6,222	20,658	459,088	470,800
Lanark	26,794	118,201	231,290	194 963	32,893	38,221	375,857	412,713
Totals	202,267	580,554	2,044,937	1,933,110	1,231,841	1,412,035	4,316,062	4,394,476
Victoria	107,169	208,887	550,598	587,553	352,134	339,564	399,153	442,808
Peterborough	158,501	226,421	413,861	446,076	167,869	212,720	298,579	391,633
Haliburton	283	452	12,226	11,077	3,522	4,932	41,147	54,837
Hastings	100,974	182,083	309,306	366,111	479,503	680,375	421,926	504,535
Totals	366,927	617,843	1,285,991	1,410,817	1,003,028	1,237,591	1,160,805	1,393,813
Muskoka	167	436	22,177	30,276	7,531	4,932	80,150	89,718
Parry Sound	381	664	30,553	47,489	9,275	11,999	49,362	54,521
Algoma	576	8,827	76,082	127,475	8,770	7,893	43,484	55,708
Totals	1,124	9,927	128,812	205,240	25,576	24,824	172,996	199,947
The Province	16,677,693	12,239,805	11,892,264	10,406,887	10,247,806	10,496,172	19,097,476	20,737,971

VALUES.

Values of the principal Farm Crops in 1883 and 1884, based on the average Market values of produce per acre for the three years 1882, 1883 and 1884.

Rye.		Peas.		Totals.		Average Values of Produce per Acre for the three Years 1882, 1883 and 1884.					
1884.	1883.	1884.	1883.	1884.	1883.	Fall Wheat.	Spring Wheat.	Barley.	Oats.	Rye.	Peas.
$	$	$	$	$	$	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
12,751	8,835	61,344	36,496	1,023,986	889,872	17 94	15 38	15 32	14 15	12 80	13 93
8,820	3,173	84,055	55,529	1,768,126	1,277,550	17 96	15 36	15 58	15 68	13 69	13 98
11,455	16,932	93,773	60,617	1,338,684	1,148,291	18 88	17 90	15 96	15 03	11 64	12 40
61,482	67,886	184,459	126,037	1,277,764	985,642	17 87	15 26	16 56	13 92	9 89	15 31
9,119	14,867	147,088	109,280	1,218,198	815,165	15 18	15 30	12 37	13 28	11 08	12 60
5,657	5,511	48,781	35,607	787,049	542,698	14 10	15 94	14 10	12 48	10 54	11 60
109,314	117,304	619,500	423,566	7,418,807	5,659,218	17 33	15 72	14 32	14 27	10 56	13 44
2,422	3,816	82,179	43,985	1,542,686	1,098,834	16 93	15 88	13 94	14 18	9 89	12 45
1,507	7,052	425,198	328,521	3,466,664	2,874,371	19 41	16 50	16 86	14 80	10 46	14 73
1,278	8,388	485,203	591,251	2,348,938	2,449,585	19 48	14 81	16 34	13 52	10 22	16 08
5,207	19,856	992,580	963,757	7,358,288	6,422,790	18 91	15 83	15 97	14 23	10 22	15 24
4,435	17,387	666,901	704,615	2,918,207	3,424,174	21 24	15 91	15 84	13 44	10 62	15 42
19,620	48,182	513,113	437,364	3,392,070	2,968,522	21 62	17 15	16 17	13 83	12 62	16 05
24,055	65,569	1,180,014	1,141,979	6,310,277	6,392,696	21 48	16 39	16 02	13 60	12 22	15 67
3,490	7,962	186,624	120,218	3,033,030	2,466,141	19 55	19 09	15 44	15 62	10 94	15 96
9,781	13,845	171,080	115,321	2,238,131	1,877,079	18 38	20 03	18 43	16 00	8 99	15 05
6,055	9,905	134,084	87,683	1,326,207	932,855	19 40	16 85	16 86	16 00	9 48	14 24
1,481	5,403	323,332	208,151	2,731,148	2,034,476	19 86	18 66	17 47	16 24	10 08	14 70
8,095	16,357	578,743	384,138	2,856,067	2,551,256	19 75	16 89	16 94	14 83	11 88	15 52
5,867	9,585	201,979	177,117	1,830,924	1,582,787	21 11	18 18	18 65	15 76	11 44	16 11
8,670	15,111	133,012	163,529	1,076,225	1,155,264	19 76	15 18	14 45	12 90	11 61	13 37
43,439	78,168	1,728,854	1,256,157	15,091,732	12,599,858	19 67	17 40	17 05	15 44	10 57	14 65
7,008	9,570	63,109	44,113	828,433	555,886	17 69	16 17	15 82	14 08	9 82	13 64
11,238	16,412	121,156	115,361	1,521,001	1,215,381	19 63	16 23	17 71	15 85	11 55	14 28
2,605	11,333	159,042	164,364	1,137,416	993,574	18 41	17 69	17 30	14 94	11 09	16 86
10,695	41,525	204,594	143,161	1,893,903	1,719,037	21 29	18 39	17 12	15 50	13 33	15 19
15,142	39,778	432,081	323,208	3,591,169	3,074,651	21 40	19 33	17 24	16 61	10 06	15 73
28,716	64,816	360,639	344,951	2,712,719	2,803,330	21 69	18 86	17 00	14 88	11 91	14 79
23,830	96,076	278,904	263,672	2,191,020	2,336,160	20 61	18 99	17 03	15 15	10 27	14 39
81,080	181,138	271,583	248,364	1,927,557	2,050,857	21 06	16 28	14 61	13 24	9 10	12 82
81,959	134,125	94,984	52,746	943,879	998,289	13 74	15 09	12 29	11 04	8 71	12 15
262,273	594,773	1,986,092	1,699,940	16,747,097	15,747,165	20 08	18 25	15 96	15 04	9 89	14 60
50,820	94,503	106,853	92,582	954,573	1,081,741	17 95	16 48	13 73	12 48	9 83	14 18
40,955	76,091	171,409	131,748	836,095	996,269	18 43	16 56	15 14	12 78	10 97	13 96
62,312	173,511	94,591	91,181	1,403,385	1,492,504	17 84	16 40	15 15	13 08	11 80	14 02
24,540	48,537	31,029	34,282	625,011	686,984	18 45	18 02	18 82	14 24	16 72	16 77
7,939	14,394	53,872	41,487	468,485	515,665	17 87	17 92	17 23	14 08	14 42	15 27
1,352	1,914	80,157	77,319	543,272	617,719	15 69	15 16	13 77	13 46	11 37	12 58
7,591	4,884	158,488	107,358	639,517	522,892	11 09	14 68	13 72	11 29	11 31	10 19
2,818	12,395	103,679	54,285	452,915	403,696	17 72	15 88	15 02	13 44	12 61	14 60
81,790	101,731	244,214	172,998	1,671,048	1,512,805	14 44	16 25	16 88	15 70	11 58	15 52
76,595	132,450	323,759	340,127	1,258,735	1,529,579	17 81	17 94	16 82	14 13	13 38	15 28
41,876	116,018	160,534	194,677	869,244	1,074,793	19 23	16 74	16 96	14 58	12 79	16 94
398,588	776,428	1,528,585	1,338,044	9,722,230	10,434,647	17 66	16 65	15 02	13 75	12 12	14 36
8,127	24,930	232,841	210,012	1,650,022	1,813,754	18 48	16 75	15 38	13 57	10 65	14 73
25,835	61,496	201,800	212,911	1,266,445	1,551,257	21 01	15 72	16 24	13 78	10 66	14 79
2,872	6,191	20,950	25,205	81,000	102,694	15 17	10 96	14 94	10 27	11 96	14 18
89,569	246,808	217,742	188,365	1,619,020	2,168,277	18 87	17 60	14 68	12 17	10 46	12 28
126,403	339,425	673,333	636,493	4,616,487	5,635,982	19 48	16 52	15 14	12 94	10 52	13 84
4,954	10,798	40,419	33,525	155,398	169,685	15 73	16 01	13 28	12 60	13 89	14 42
8,661	13,620	19,652	24,539	117,884	152,832	17 47	16 51	14 23	12 07	13 79	14 61
1,116	2,260	48,366	60,343	178,394	262,506	23 19	21 68	15 38	14 89	11 69	19 01
14,731	26,678	108,437	118,407	451,676	585,023	22 04	19 95	14 32	12 94	13 63	16 47
984,010	2,018,201	8,817,395	7,578,343	67,716,644	63,477,379	19 20	17 18	15 84	14 36	10 96	14 66

VALUES.

TABLE No. XXXI.—Showing by County Municipalities and groups of Counties value per acre

COUNTIES.	Farm Lands.		Buildings.		Implements.	
	1884.	1883.	1884.	1883.	1884.	1883.
	$	$	$	$	$	$
Essex	15,520,763	14,475,555	3,431,738	3,097,900	994,166	838,530
Kent	24,422,201	24,897,490	4,937,403	4,744,620	1,455,042	1,362,745
Elgin	18,581,702	20,073,920	4,707,072	4,636,160	1,225,966	1 137,950
Norfolk	12,093,433	12,488,760	4,166,794	3,759,840	1,018,529	947,180
Haldimand	9,381,394	10,050.715	3,340,933	3,002,785	867,631	827,635
Welland	9,315,480	9,306,570	3,097,826	2,759,260	789,569	669,470
Totals	89,314,973	91,293,010	23,681,766	22,000,565	6,350,903	5,783,480
Lambton	20,621,531	20,792,540	4,164,031	3,568,010	1,258,628	1,017,320
Huron	31,843,194	34,208,740	7,631,917	7,830,240	2,209,869	2,120,.95
Bruce	21,990,914	23,658,920	5,246,889	4,960,150	1,559,271	1,499,080
Totals	74,455,639	78,660,200	17,042,837	16,358,400	5,027,768	4,636,5 5
Grey	22,999,443	24,969,450	5,874,615	5,785,730	1,999,313	1,939,230
Simcoe	25,353,060	26,063,345	6,619,229	6,134,830	2,060,679	1,805,240
Totals	48,352,503	51,032,795	12,493,844	11,920,560	4,059,992	3,744,470
Middlesex	37,796,560	39,991,385	9,620,935	8,768,615	2,527,311	2,209,775
Oxford	24,221,100	26,449,095	6,785,070	6,636,620	1,541,124	1,521,350
Brant	10,632,655	11,838,450	3,547,568	3,476,915	896,846	764,275
Perth	22,810,271	24,916,705	6,031,652	5,698,645	1,818,495	1,662,300
Wellington	22,533,055	23,235,435	6,839,765	5,879,315	1,986,719	1,702,375
Waterloo	15,072,219	16,004,965	4,811,772	4,614,480	1,198,035	1,125,990
Dufferin	9,055,905	9,018,330	2,347,253	1,779,840	762,170	608,240
Totals	142,121,765	151,454,365	39,984,015	36,854,430	10,730,700	9,594,305
Lincoln	8,528,409	9,123,960	3,290,093	3,152,655	753,336	709,790
Wentworth	13,232,700	14,127,535	4,434,557	4,528,845	1,106,687	1,050,445
Halton	9,229,904	9,589,195	3,046,310	2,942,985	785,606	724 830
Peel	12,436,770	13,933,415	4,084,775	3,586,255	1,031,872	980,515
York	29,004,976	30,912,735	7,762,989	7,654,825	1,880,906	1,901,795
Ontario	20,837,762	21,707,645	5,593,498	5,365,510	1,860,270	1,303,215
Durham	16,339,126	16,946,310	4,385,041	4,153,665	1,107,568	1,085,070
Northumberland	16,086,782	16,495,865	4,575,771	4,392,040	1,244,238	1,086,290
Prince Edward	9,540,574	9,968,580	3,365,877	3,075,265	920,912	678,600
Totals	135,237,003	142,810,180	40,538,911	38,852,045	10,691,395	9,520,550
Lennox and Addington	10,087,998	10,504,835	2,748,955	2,832,175	775,726	713,415
Frontenac	8,195,588	8,914,765	2,469,345	2,404,085	713,763	670,175
Leeds and Grenville	16,647,050	17,097,955	5.495,766	4,935,555	1,465,959	1,304,725
Dundas	8,012,927	8,690,005	2,228,666	2,283,980	567,361	541.470
Stormont	5,698,076	5,879,060	1,892,689	1,726,385	459,027	448,225
Glengarry	6,772,382	6,727,320	2,101,043	1,862,970	585,025	493,910
Prescott	5,758,442	5,970,205	1,578,006	1,402,160	472,191	400,285
Russell	4.417,791	4,840,940	1,030,591	1,001,065	325,487	328,295
Carleton	12,999,069	13,416,830	3,738,632	3,500,615	1,187,255	1,046,400
Renfrew	5,551,976	5,484,770	2,107,283	2,082,115	631,207	605,135
Lanark	7,336,645	7,395,920	2,685,232	2,300,555	788,053	643,080
Totals	91,477,944	94,922,605	28,076,208	26,331.660	7,971,054	7,195,055
Victoria	12,069,266	12,952,600	2,753,276	2,706,475	784,393	829,260
Peterborough	10,340,124	10,619,525	2,741,669	2,522,630	688,601	631,515
Haliburton	771,890	553,880	194,939	179,600	55,285	59,810
Hastings	15,226,359	15,802,430	4,448,999	4,305,655	1,341,206	1,196,920
Totals	38,407,639	39,928,435	10,138,883	9,714,360	2,869,485	2,717,505
Muskoka	2,178,162	1,912,805	546,808	440,470	184,763	127,250
Parry Sound	1,065,337	1,197,235	326,913	287,540	132,692	96,440
Algoma	1,503,741	1,581,395	291,555	270,645	92,297	106,880
Totals	4,747,240	4,691,435	1,165,276	998,655	409,752	330,570
Grand Totals	624,114,706	654,793,025	173,121,740	163,030,675	48,111,049	43,522,530

VALUES.

the Value of Farm Property in Ontario in the years 1883 and 1884; also the average for the two years.

Live Stock.		Totals.		Average Value per Acre of—									
				Farm Land.		Buildings.		Implements.		Live Stock.		Totals.	
1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
$	$	$	$	$	$	$	$	$	$	$	$	$	$
2,081,624	2,098,185	22,028,291	20,510,170	36 50	33 84	8 07	7 24	2 34	1 96	4 90	4 91	51 81	47 95
2,825,693	2,992,765	33,640,339	33,997,620	43 22	44 73	8 74	8 52	2 58	2 45	5 00	5 38	59 54	61 08
2,695,236	2,691,055	27,209,976	28,539,085	42 28	46 12	10 71	10 65	2 79	2 61	6 13	6 18	61 91	65 56
1,845,058	1,790,725	19,123,814	18,986,505	30 59	31 91	10 54	9 61	2 58	2 42	4 67	4 57	48 38	48 51
1,787,649	1,583,295	15,377,607	15,464,400	33 44	35 73	11 91	10 68	3 09	2 94	6 37	5 63	54 81	54 98
1,322,871	1,275,760	14,525,746	14,011,060	40 93	41 07	13 61	12 18	3 47	2 95	5 81	5 63	63 82	61 83
12,558,131	12,431,785	131,905,773	131,508,840	38 28	39 37	10 15	9 49	2 72	2 49	5 38	5 36	56 53	56 71
2,989,754	2,696,220	29,033,944	28,074,090	32 17	32 40	6 59	5 56	1 96	1 58	4 67	4 20	45 30	43 74
5,444,831	5,515,555	47,129,811	49,674,730	39 96	42 96	9 58	9 83	2 77	2 66	6 83	6 93	59 14	62 38
3,882,211	3,870,395	32,679,285	33,988,545	26 75	28 36	6 38	5 94	1 90	1 80	4 72	4 64	39 75	40 74
12,316,796	12,082,170	108,843,040	111,737,365	32 95	34 62	7 54	7 20	2 22	2 04	5 45	5 31	48 16	49 17
5,041,694	4,652,355	35,915,065	37,346,765	21 39	23 50	5 46	5 44	1 86	1 83	4 69	4 37	33 40	35 14
4,164,107	3,956,790	38,197,075	37,960,205	26 43	27 38	6 90	6 44	2 14	1 90	4 34	4 16	39 81	39 88
9,205,801	8,609,145	74,112,140	75,306,970	23 76	25 46	6 14	5 95	2 00	1 87	4 52	4 29	36 42	37 57
6,225,189	6,074,640	56,169,995	57,044,415	49 88	52 74	12 70	11 57	3 33	2 91	8 22	8 01	74 13	75 23
3,683,024	3,649,750	36,230,318	38,256,815	51 37	56 21	14 39	14 10	3 27	3 23	7 81	7 76	76 84	81 30
1,661,500	1,592,480	16,738,569	17,672,120	49 24	54 81	16 43	16 10	4 15	3 54	7 70	7 37	77 52	81 82
4,002,027	3,843,140	34,662,445	36,120,790	44 09	48 04	11 66	10 99	3 51	3 20	7 73	7 41	66 99	69 64
4,744,786	3,951,615	36,104,325	34,768,740	36 00	37 10	10 93	9 38	3 17	2 72	7 58	6 31	57 68	55 51
2,552,248	2,163,600	23,634,274	23,909,035	49 16	52 32	15 69	15 08	3 91	3 68	8 32	7 07	77 08	78 15
1,656,156	1,428,865	13,821,484	12,835,275	25 49	25 32	6 61	4 99	2 14	1 71	4 66	4 01	38 90	36 03
24,524,930	22,704,090	217,361,410	220,607,190	43 73	46 57	12 30	11 33	3 30	2 95	7 54	6 98	66 87	67 83
1,330,799	1,339,640	13,902,637	14,330,985	44 82	48 22	17 29	16 65	3 96	3 75	7 00	7 08	73 07	75 70
2,018,067	2,076,980	20,792,011	21,783,805	48 11	51 66	16 12	16 56	4 02	3 84	7 34	7 60	75 59	79 66
1,695,491	1,484,730	14,757,311	14,741,740	41 16	42 96	13 59	13 18	3 50	3 25	7 56	6 65	65 81	66 04
2,218,973	1,917,855	19,772,390	20,418,040	43 18	48 32	14 18	12 44	3 58	3 40	7 71	6 65	68 65	70 81
4,001,497	3,999,895	42,650,368	44,469,160	53 77	57 38	14 39	14 21	3 49	3 53	7 42	7 42	79 07	82 54
3,553,043	3,361,045	31,844,573	31,737,415	41 82	43 67	11 23	10 80	3 73	2 62	7 13	6 76	63 91	63 85
2,561,269	2,378,845	24,393,004	24,563,890	44 42	45 88	11 92	11 25	3 01	2 94	6 96	6 44	66 31	66 51
2,461,280	2,325,050	24,368,071	24,299,245	36 94	38 26	10 50	10 19	2 86	2 52	5 65	5 39	55 95	56 36
1,260,958	1,190,085	15,088,321	14,912,530	41 43	43 20	14 62	13 33	4 00	2 94	5 47	5 15	65 52	64 62
21,101,377	20,074,035	207,568,686	211,256,810	44 36	46 96	13 29	12 77	3 51	3 13	6 92	6 60	68 08	69 46
1,389,886	1,372,990	15,002,565	15,423,415	25 28	26 74	6 89	7 20	1 94	1 82	3 48	3 49	37 59	39 26
1,313,171	1,352,825	12,691,867	13,341,850	12 60	13 93	3 79	3 75	1 10	1 05	2 02	2 11	19 51	20 84
3,130,313	3,012,695	26,739,088	26,350,930	22 18	23 06	7 33	6 66	1 95	1 76	4 17	4 06	35 63	35 54
1,212,419	1,251,805	12,021,373	12,767,260	33 76	36 91	9 39	9 70	2 39	2 30	5 11	5 32	50 65	54 23
958,164	1,035,745	9,007,956	9,089,415	22 84	23 57	7 59	6 92	1 84	1 80	3 84	4 15	36 11	36 44
1,271,364	1,348,490	10,729,814	10,432,690	23 21	22 93	7 20	6 35	2 00	1 68	4 36	4 60	36 77	35 56
988,650	950,590	8,797,289	8,723,240	20 16	20 76	5 52	4 88	1 65	1 39	3 46	3 30	30 79	30 37
700,850	755,300	6,474,719	6,925,540	17 66	19 41	4 12	4 01	1 30	1 32	2 80	3 03	25 88	27 73
2,158,438	2,381,445	20,083 394	20,345,290	23 30	24 02	6 70	6 27	2 13	1 87	3 87	4 27	36 00	36 43
1,657,275	1,720,865	9,947,741	9,892,885	6 86	6 79	2 60	2 58	78	75	2 05	2 12	12 29	12 24
1,909,336	1,706.995	12,719,266	12,046,550	11 02	11 63	4 03	3 62	1 18	1 01	2 87	2 68	19 10	18 94
16,689,866	16,889,745	144.215,072	145.339,065	17 77	18 64	5 45	5 17	1 55	1 41	3 24	3 32	28 91	28 54
1 916,712	1,981,485	17,523,647	18,469,820	21 47	23 04	4 90	4 81	1 39	1 48	3 41	3 52	31 17	32 85
1.585,728	1,541,690	15,356,122	15,315,360	19 63	20 41	5 20	4 85	1 31	1 21	3 01	2 96	29 15	29 43
192,500	192 220	1,214,614	985,510	1 44	1 06	37	34	10	11	36	37	2 27	1 88
2,426,878	2,597,985	23,443,442	23,902,990	16 79	17 65	4 90	4 81	1 48	1 33	2 68	2 90	25 85	26 69
6.121,818	6,313,380	57,537,825	58,673,680	15 18	15 95	4 01	3 88	1 13	1 09	2 42	2 52	22 74	23 44
506,181	416,380	3,415,914	2,896,905	4 37	4 01	1 10	92	37	27	1 01	87	6 85	6 07
274,977	280.695	1,799,919	1,861,910	4 51	5 89	1 38	1 42	56	47	1 16	1 38	7 61	9 16
268,168	280,940	2,155,761	2,239,860	4 04	5 55	78	95	25	38	72	98	5 79	7 86
1.049,326	978,015	7,371,594	6,998,675	4 29	4 86	1 05	1 04	37	34	95	1 01	6 66	7 25
103,568,045	100,082,365	948,915,540	961,428,595	28 74	30 51	7 97	7 60	2 22	2 03	4 77	4 66	43 70	44 80

FACTORY CHEESE.

TABLE No. XXXII.—Showing the quantity and value of Cheese made at 567 Factories in 1884, the average dates of opening and closing for the season, and the total number of Factories in operation; also, the totals for three years.

COUNTIES.	Factories. No. in Operation. 1883.	1884.	No. making Returns.	Quantity of— Milk Used.	Cheese Made.	Value of Cheese made.	Milk required to make 1 lb. Cheese.	Value of Cheese per 100 lbs.	Average Date of— Opening.	Closing.
				lbs.	lbs.	$ c.	lbs.	$ c.		
Essex	1	1	1	199,743	18,529	1,800 74	10.78	9 72	June 2	Oct. 1
Kent	15	15	9	6,046,138	583,152	60,849 19	10.37	10 43	May 14	Nov. 1
Elgin	30	24	20	16,555,811	1,584,686	168,624 42	10.45	10 64	April 29	" 3
Norfolk	23	20	18	17,818,532	1,720,674	181,633 59	10.36	10 56	" 30	" 5
Haldimand	7	9	7	4,564,375	443,691	46,805 34	10.29	10 55	May 11	" 1
Welland	3	5	5	975,601	92,813	9,660 96	10.51	10 41	" 18	Oct. 10
Totals	79	74	60	46,160,200	4,443,545	469,374 24	10.39	10 56	May 4	Oct. 31
Lambton	19	21	19	14,015,466	1,321,718	138,778 24	10.60	10 50	May 15	Oct. 27
Huron	19	18	14	14,806,870	1,412,019	151,669 50	10.49	10 74	" 12	" 28
Bruce	15	18	15	11,067,972	1,066,847	111,694 16	10.38	10 47	" 16	" 19
Totals	53	57	48	39,890,308	3,800,584	402,081 90	10.50	10 58	May 15	Oct. 25
Grey	7	7	6	3,142,024	311,037	31,672 80	10.10	10 18	May 15	Oct. 20
Simcoe	6	7	6	2,860,710	278,381	29,390 36	10.28	10 56	" 15	" 19
Totals	13	14	12	6,002,734	589,418	61,063 16	10.18	10 36	May 15	Oct. 20
Middlesex	41	41	34	35,964,948	3,444,333	374,163 16	10.44	10 86	May 1	Nov. 7
Oxford	40	53	35	60,791,202	5,806,430	633,568 15	10.47	10 91	April 18	" 17
Brant	8	9	7	6,172,550	604,853	65,353 98	10.21	10 80	" 22	" 6
Perth	25	25	22	26,272,328	2,504,872	274,216 96	10.49	10 95	May 4	" 6
Wellington	10	13	10	12,426,438	1,163,844	126,604 16	10.67	10 88	" 8	" 2
Waterloo	10	11	5	4,925,247	467,975	49,402 47	10.52	10 56	" 14	Oct. 24
Dufferin	4	3	3	2,248,066	211,132	21,850 42	10.65	10 34	" 12	" 16
Totals	138	155	116	148,800,779	14,203,439	1,545,159 30	10 48	10 88	April 29	Nov. 8
Lincoln	4	5	3	1,428,057	138,075	14,510 80	10.34	10 51	May 9	Nov. 1
Wentworth	4	6	4	3,830,544	371,969	38,555 29	10.30	10 37	April 29	" 10
Halton	3	3	2	55,000	5,500	570 00	10.00	10 36	June 1	Oct. 2
Peel	3	3	2	1,673,473	156,576	15,935 39	10.69	10 18	May 21	" 23
York	1	3	3	566,174	53,520	5,737 41	10.58	10 72	" 24	Sept. 20
Ontario	7	8	6	1,653,436	157,145	15,897 72	10.52	10 12	" 20	Oct. 18
Durham	4	4	3	2,780,720	269,065	28,218 77	10.33	10 49	" 9	Nov. 1
Northumberland	31	32	21	21,105,727	2,081,145	209,409 95	10.14	10 06	" 3	Oct. 30
Prince Edward	19	16	9	9,925,755	989,181	99,995 82	10.03	10 11	April 26	" 31
Totals	76	80	53	43,018,886	4,222,176	428,831 15	10.19	10 16	May 8	Oct. 26
Lennox and Addington	14	18	15	18,222,097	1,815,632	184,066 01	10.04	10 14	May 1	Oct. 27
Frontenac	26	32	22	12,158,158	1,229,338	124,046 82	9.89	10 09	" 5	" 21
Leeds and Grenville	73	91	55	56,095,513	5,644,028	587,247 65	9.94	10 40	April 24	Nov. 1
Dundas	72	20	18	14,837,209	1,490,285	153,462 13	9.96	10 30	May 3	Oct. 31
Stormont		24	21	16,437,160	1,637,190	164,570 48	10.04	10 01	" 1	" 28
Glengarry		47	35	24,677,794	2,341,574	238,853 52	10.54	10 20	" 1	" 23
Prescott		22	15	8,468,169	851,895	83,958 52	9.94	9 86	" 7	" 24
Russell	3	7	6	2,157,374	216,442	21,961 55	9.97	10 15	" 8	" 16
Carleton	5	7	4	2,492,976	248,737	25,131 45	10.02	10 10	" 22	" 13
Renfrew	3	5	4	1,894,324	188,322	18,511 80	10.06	9 83	" 12	" 18
Lanark	12	18	17	14,848,269	1,464,664	149,465 57	10.14	10 20	" 10	" 20
Totals	208	291	212	172,289,043	17,128,107	1,751,275 50	10.06	10 22	May 2	Oct. 26
Victoria	9	10	5	2,715,570	265,133	27,494 70	10.24	10 37	May 13	Oct. 24
Peterborough	15	19	16	10,220,964	993,019	98,782 26	10.29	9 95	" 8	" 26
Hastings	44	51	45	48,801,319	4,893,511	500,062 27	9.97	10 22	April 24	Nov 1
Totals	68	80	66	61,737,853	6,151,663	626,339 23	10.04	10 18	April 28	Oct. 31
The Province—										
1884	.....		751	567	517,899,803	50,538,932	5,284,124 48	10.25	10 46	May 3	Oct. 30
1883	635	.....		440	373,962,719	37,079,896	3,872,927 52	10.09	10 44	" 3	" 30
1882	.....	.....		305	265,813,755	25,562,431	2,767,085 00	10.40	10 82	.....	.....

FACTORY CHEESE

TABLE No. XXXIII.—Showing for 445 Factories, making complete returns in 1884, the averages of days in operation, of number of patrons, of number of cows, and of value of product per cow; also, the totals for three years.

COUNTIES.	No. of Factories Returned.	Average No. of days worked.	Quantity of—		Value of Cheese Made.	No. of Patrons.	Average No. of Cows.	Value of Product per Cow—	
			Milk Used.	Cheese Made.				Per Season.	Per Day.
			lbs.	lbs.	$ c.			$ c.	c.
Essex	1	104	199,743	18,529	1,800 74	16	108	16 67	16.0
Kent	5	149	3,385,345	324,843	34,417 14	303	1,210	28 44	19.1
Elgin	15	162	13,349,164	1,286,357	136,399 40	961	4,728	28 85	17.8
Norfolk	12	165	13,097,925	1,266,404	133,738 54	876	4,480	29 85	18.1
Haldimand	6	150	3,125,307	303,949	32,151 33	279	1,336	24 08	16.1
Welland	5	127	975,601	92,813	9,660 96	115	518	18 65	14.7
Totals	44	159	34,133,085	3,292,895	348,168 11	2,550	12,380	28 12	17.7
Lambton	14	145	10,576,520	991,349	104,525 57	857	4,297	24 33	16.7
Huron	10	142	11,839,995	1,134,543	122,798 38	983	4,173	29 43	20.7
Bruce	11	137	8,150,910	783,762	82,616 27	777	3,191	25 89	18.9
Totals	35	142	30,567,425	2,909,654	309,940 22	2,617	11,661	26 58	18.7
Grey	4	135	2,313,054	228,609	23,216 65	239	930	24 96	18.5
Simcoe	4	135	1,997,385	193,025	20,047 81	211	838	23 92	17.7
Totals	8	135	4,310,439	421,634	43,264 46	450	1,768	24 47	18.2
Middlesex	29	168	31,500,950	3,018,615	328,840 30	1,798	10,432	31 52	18.8
Oxford	26	182	52,507,491	5,016,725	549,544 10	2,061	16,801	32 71	18.0
Brant	5	166	5,370,901	528,412	57,481 17	366	2,100	27 37	16.5
Perth	18	156	22,862,923	2,177,700	238,656 12	1,280	7,718	30 92	19.8
Wellington	8	153	10,756,396	999,679	109,081 44	692	3,704	29 45	19.2
Waterloo	5	144	4,925,247	467,975	49,402 47	371	1,792	27 57	19.1
Dufferin	2	146	1,782,007	166,461	17,325 25	119	650	26 65	18.3
Totals	93	169	129,705,915	12,375,567	1,350,330 85	6,687	43,197	31 26	18.5
Lincoln	3	150	1,428,057	138,075	14,510 80	155	488	29 73	19.9
Wentworth	3	166	3,563,487	347,175	35,915 49	258	1,350	26 60	16.0
Halton	2	93	55,000	5,500	570 00	7	40	14 25	15.3
Peel	2	126	1,673,473	156,576	15,935 39	113	661	24 11	19.1
York	2	108	458,477	43,451	4,629 41	48	230	20 13	18.6
Ontario	4	141	1,189,188	114,451	11,722 66	110	460	25 48	18.1
Durham	3	149	2,780,720	269,065	28,218 77	225	1,050	26 87	18.0
Northumberland	19	159	18,433,701	1,819,747	182,420 68	991	6,280	29 05	18.3
Prince Edward	8	163	8,622,455	856,389	86,913 44	622	3,069	28 32	17.4
Totals	46	156	38,204,558	3,750,429	380,836 64	2,529	13,628	27 95	17.9
Lennox and Addington	12	153	14,675,522	1,465,680	148,533 02	1,080	6,195	23 98	15.7
Frontenac	18	148	9,324,258	943,219	95,108 33	487	3,684	25 82	17.4
Leeds and Grenville	51	165	52,943,034	5,320,079	554,678 54	1,982	18,882	29 38	17.8
Dundas	12	155	10,018,941	1,004,402	102,633 97	403	4,032	25 45	16 4
Stormont	13	156	10,132,633	1,012,917	100,991 84	534	4,418	22 86	14.6
Glengarry	25	160	18,631,981	1,744,288	178,225 96	1,019	11,002	16 20	10.1
Prescott	9	153	5,602,897	566,768	55,983 75	280	2,550	21 95	14.3
Russell	6	138	2,157,374	216,442	21,961 55	110	956	22 97	16.7
Carleton	2	125	906,281	90,112	9,110 25	53	430	21 19	17.0
Renfrew	4	132	1,894,324	188,322	18,511 80	152	970	19 08	14.5
Lanark	13	142	10,711,689	1,063,072	107,263 12	623	4,413	24 31	17.1
Totals	165	157	136,998,934	13,615,301	1,393,002 13	6,723	57,532	24 21	15.5
Victoria	4	141	2,155,749	209,527	21,942 10	171	800	27 43	19 4
Peterborough	10	148	7,296,735	707,304	69,902 51	411	2,696	25 93	17.5
Hastings	40	165	42,907,825	4,312,716	439,820 99	1,877	14,704	29 91	18.1
Totals	54	161	52,340,309	5,229,547	531,665 60	2,459	18,200	29 21	18.1
The Province—									
1884	445	159	426,260,665	41,595,027	4,357,208 01	24,015	158,366	27 51	17.3
1883	385	156	327,353,679	32,495,811	3,396,882 21	19,797	117,577	28 89	18.5
1882	266	.....	233,105,965	22,372,566	2,401,712 00	13,349	85,226	28 18	.....

RURAL AREA.

TABLE No. XXXIV.—Showing by County Municipalities and groups of Counties the

COUNTIES.	Acres of Assessed Land.			
	Resident.	Non-Resident.	Total Occupied.	
			1884.	1883.
Essex	389,110	36,077	425,187	427,702
Kent	538,371	26,649	565,020	556,584
Elgin	433,443	6,026	439,469	435,254
Norfolk	384,152	11,147	395,299	391,390
Haldimand	280,344	171	280,515	281,236
Welland	221,034	6,567	227,601	226,580
Totals	2,246,454	86,637	2,333,091	2,318,746
Lambton	565,075	75,785	640,860	641,821
Huron	781,019	15,780	796,799	796,257
Bruce	782,426	39,662	822,088	834,245
Totals	2,128,520	131,227	2,259,747	2,272,323
Grey	1,025,012	50,417	1,075,429	1,062,671
Simcoe	869,263	90,132	959,395	951,970
Totals	1,894,275	140,549	2,034,824	2,004,641
Middlesex	742,923	14,775	757,698	758,220
Oxford	469,746	1,774	471,520	470,543
Brant	212,705	3,200	215,905	215,990
Perth	504,526	12,886	517,412	518,668
Wellington	615,430	10,433	625,863	626,314
Waterloo	305,051	1,556	306,607	305,930
Dufferin	335,273	20,046	355,319	356,212
Totals	3,185,654	64,670	3,250,324	3,251,877
Lincoln	187,436	2,830	190,266	189,312
Wentworth	266,699	8,333	275,032	273,458
Halton	222,753	1,490	224,243	223,209
Peel	287,322	687	288,009	288,349
York	528,821	10,594	539,415	538,758
Ontario	480,991	17,246	498,237	497,056
Durham	363,684	4,190	367,874	369,342
Northumberland	430,460	5,064	435,524	431,143
Prince Edward	229,484	777	230,261	230,746
Totals	2,997,650	51,211	3,048,861	3,041,373
Lennox and Addington	375,963	23,087	399,050	392,858
Frontenac	576,806	73,749	650,555	640,099
Leeds and Grenville	741,014	9,402	750,416	741,350
Dundas	234,678	2,664	237,342	235,443
Stormont	248,467	1,000	249,467	249,437
Glengarry	291,363	433	291,796	293,343
Prescott	270,618	15,050	285,668	287,571
Russell	199,072	51,155	250,227	249,414
Carleton	538,075	19,766	557,841	558,460
Renfrew	764,721	44,832	809,553	807,954
Lanark	610,418	55,461	665,879	635,861
Totals	4,851,195	296,599	5,147,794	5,091,790
Victoria	533,233	28,883	562,116	562,262
Peterborough	475,364	51,426	526,790	520,311
Haliburton	514,763	19,804	534,567	524,606
Hastings	806,524	100,276	906,800	895,492
Totals	2,329,884	200,389	2,530,273	2,502,671
Muskoka	447,962	50,676	498,638	476,588
Parry Sound	213,374	22,842	236,216	203,170
Algoma	272,664	99,884	372,548	284,888
Totals	934,000	173,402	1,107,402	964,646
The Province	20,567,632	1,144,684	21,712,316	21,458,067

RURAL AREA.

Rural Area of the Province as returned by Municipal Assessors for 1883 and 1884.

Acres Cleared.		Acres Woodland.		Swamp, Marsh or Waste, Acres.		Per Cent. of Cleared Land.	
1884.	1883.	1884.	1883.	1884.	1883.	1884.	1883.
181,163	168,234	221,185	242,026	22,839	17,442	42.6	39.3
273,392	262,624	256,656	235,572	34,972	58,388	48.4	47.2
251,392	247,800	170,402	173,942	17,675	13,512	57.2	56.9
219,087	216,565	155,240	164,311	20,972	10,514	55.4	55.3
193,287	187,776	74,203	75,528	13,025	17,932	68.9	66.8
154,484	153,064	64,329	59,835	8,788	13,681	67.9	67.6
1,272,805	1,236,063	942,015	951,214	118,271	131,469	54.6	53.3
257,333	232,329	378,714	386,154	4,813	23,338	40.2	36.2
505,725	493,720	212,643	213,625	78,431	88,912	63.5	62.0
391,846	395,571	353,277	358,452	76,965	80.222	47.7	47.4
1,154,904	1,121,620	944,634	958,231	160,209	192,472	51.1	49.4
520,045	520,988	394,009	402,647	161,375	139,036	48.4	49.0
433,027	417,739	462,993	456,566	63,375	77,665	45.1	43.9
953,072	938,727	857,002	859,213	224,750	216,701	46.8	46.8
496,965	475,448	242,438	262,545	18,295	20,227	65.6	62.7
330,771	326,306	111,272	118,034	29,477	26,203	70.1	69.3
167,370	166,459	29,689	31,575	18,846	17,956	77.5	77.1
347,792	342,052	106,820	131,594	62,800	45,022	67.2	65.9
417,509	408,286	121,425	148,169	86,929	69,859	66.7	65.2
228,607	228,303	60,828	59,530	17,172	18,097	74.6	74.6
170,663	162,030	108,267	114,655	76,389	79,527	48.0	45.5
2,159,677	2,108,884	780,739	866,102	309,908	276,891	66.4	64.9
145,972	144,679	37,718	38,409	6,576	6,224	76.7	76.4
210,384	204,191	47,467	50,450	17,181	18,817	76.5	74.3
165,974	165,197	46,207	42,065	12,062	15,947	74.0	74.0
225,169	222,432	50,155	55,278	12,685	10,639	78.2	77.1
398,335	397,129	95,809	97,058	45,271	44,571	73.8	73.7
323,926	322,960	108,422	110,659	65,889	63,437	65.0	65.0
273,057	266,755	68,019	73,148	26,798	29,439	74.2	72.2
298,818	297,014	109,125	105,653	27,581	28,476	68.6	68.9
174,587	173,937	47,637	48,256	8,037	8,553	75.8	75.4
2,216,222	2,194,294	610,559	620,976	222,080	226,103	72.7	72.1
196,850	192,693	132,049	135,960	70,151	64,205	49.3	49.0
193,223	199,635	345,235	320,259	112,097	120,205	29.7	31.2
388,647	388,553	287,017	265,479	74,752	87,318	51.8	52.4
123,317	128,055	89,874	72,820	24,151	34,568	52.0	54.4
110,009	105,967	129,895	131,014	9,563	12,456	44.1	42.5
131,566	129,049	126,118	128,024	34,112	36,270	45.1	44.0
118,722	115,662	131,314	131,887	35,632	40,022	41.6	40.2
76,508	76,345	170,146	167,112	3,573	5,957	30.6	30.6
260,996	247,125	169,208	212,506	127,637	98,829	46.8	44.3
231,292	233,117	506,377	472,061	71,884	102,776	28.6	28.9
280,129	269,449	253,538	244,967	132,212	121,445	42.1	42.4
2,111,259	2,085,650	2,340,771	2,282,089	695,764	724,051	41.0	41.0
226,441	226,760	224,142	240,524	111,533	94,978	40.3	40.3
205,690	203,266	260,197	251,781	60,903	65,264	39.0	39.1
24,105	23,656	489,730	483,101	20,732	17,849	4.5	4.5
314.913	310,816	527,420	540,388	64,467	44,288	34.7	34.7
771,149	764,498	1,501,489	1,515,794	257,635	222,379	30.5	30.5
44,953	43,169	402,725	370,543	50,960	62,876	9.0	9.1
25,740	22,722	197,667	156,917	12,809	23,531	10.9	11.2
26,305	23,930	337,118	244,258	9,125	16,700	7.1	8.4
96,998	89,821	937,510	771,718	72,894	103.107	8.8	9.3
10,736,086	10,539,557	8,914,719	8,825,337	2,061,511	2,093,173	49.4	49.1

ASSESSMENT AND TAXATION.

TABLE No. XXXV.—Showing for the eleven years 1873-1883 the Assessment and Debt of Rural and Urban Municipalities in the Province; the amount of local taxation levied for Municipal and School purposes; the rate of taxation per head for both purposes according to the municipal censuses, and the rate on the dollar of assessed values.

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of—		Bonded Debt.	Floating Debt.	Amount of Taxes levied for—		Rate of Taxation for Municipal and School Purposes—	
				Real Property.	Personal Property.			Municipal Purposes.	School Purposes.	Per head of Population.	Mills on $.
				$	$	$	$	$	$	$ c.	Mills.
ESSEX:											
1873	Rural	5,522	414,121	2,945,562	275,914	28,764	11,651	55,853	35,575	4 12	28.4
	Urban	2,009	4,031	1,649,100	152,050	178,150	2,700	27,736	13,451	5 10	22.8
	Total	7,531	418,152	4,594,662	427,964	228,914	14,351	83,589	49,026	4 38	26.4
1874	Rural	5,846	405,609	3,299,239	304,451	38,015	5,731	55,248	36,020	3 89	25.3
	Urban	2,167	4,030	1,830,875	175,720	185,650	10,000	32,535	17,989	5 51	25.2
	Total	8,013	409,639	5,130,114	480,171	247,665	31,131	87,783	54,009	4 34	25.3
1875	Rural	5,897	414,169	4,193,709	361,189	53,871	9,084	65,109	37,575	4 27	22.5
	Urban	2,355	4,030	1,984,680	224,300	233,500	8,076	30,893	15,910	4 88	21.2
	Total	8,252	418,199	6,178,389	585,489	322,771	17,160	96,002	53,485	4 45	22.1
1876	Rural	6,011	413,718	4,461,129	320,513	48,116	8,031	58,262	39,427	3 85	20.4
	Urban	2,312	4,030	2,162,409	277,033	249,350	24,328	38,138	15,880	5 55	22.1
	Total	8,323	417,748	6,623,538	597,546	332,466	32,359	96,400	55,307	4 32	21.0
1877	Rural	6,257	414,585	4,438,165	309,686	45,114	11,314	54,355	37,644	3 58	19.4
	Urban	2,906	5,291	2,292,843	227,856	268,500	10,468	38,260	21,706	5 47	23.8
	Total	9,163	419,876	6,731,008	537,542	347,614	21,782	92,615	59,350	4 15	20.9
1878	Rural	6,268	418,988	4,662,830	331,438	26,539	7,771	57,658	36,722	3 65	18.9
	Urban	3,184	5,765	2,458,854	198,100	282,050	39,422	40,324	21,152	5 27	23.1
	Total	9,452	424,753	7,121,684	529,538	341,589	47,193	97,982	57,874	4 16	20.4
1879	Rural	6,530	413,648	4,418,873	285,097	98,134	20,504	54,522	39,888	3 41	20.1
	Urban	3,293	5,772	2,441,883	179,944	280,800	35,746	38,328	20,795	4 90	22.5
	Total	9,823	419,420	6,860,756	465,041	409,934	56,250	92,850	60,683	3 86	21.0
1880	Rural	6,754	419,789	4,543,695	302,010	49,367	24,387	58,078	39,623	3 45	20.2
	Urban	3,155	5,742	2,410,171	158,382	271,350	33,727	43,805	20,718	5 44	25.1
	Total	9,909	425,531	6,953,866	460,392	350,717	58,114	101,883	60,341	4 03	21.9
1881	Rural	6,738	419,789	4,850,372	288,170	90,633	27,078	59,088	39,761	3 40	19.2
	Urban	3,480	5,742	2,775,594	184.807	264,000	30,032	36,811	20.493	4 60	19.4
	Total	10,218	425,531	7,625,966	472,977	383,633	57,110	95,899	60,254	3 76	19.3
1882	Rural	6,738	414,268	4,850,372	296,610	78,817	97	59,810	43,130	3 45	20.0
	Urban	3,487	5,737	2,939,090	228,567	264,000	30,000	37,524	20,677	4 48	18.4
	Total	10,225	420,005	7,789,462	525,177	362,817	30,097	97,334	63,807	3 77	19.4
1883	Rural	7,506	417,713	6,654,938	361,251	156,912	63,228	65,632	41,991	3 49	15.3
	Urban	3,882	5,724	3,077,040	192.404	283.726	43,186	44,463	19,921	4 90	19.7
	Total	11,388	423,437	9,731,978	553,655	469,638	106,414	110,095	61,912	3 91	16.7
KENT:											
1873	Rural	7,165	565,383	3,770,257	453,492	90,510	2,589	45,918	45,000	3 19	21.5
	Urban	1,844	4,646	1,177,952	241,895	108,889	6,951	34,946	13,022	6 06	33.8
	Total	9,009	570,209	4,948,209	695,387	209,399	9,540	80,864	58,022	3 81	24.6

NOTE.—The totals of debts in this table include the bonded and floating debts of the County Municipalities. Taxation for School purposes includes Municipal and Trustee assessments for High, Public and Separate Schools. Towns separated from Counties for municipal purposes are included in the statistics of the counties in which they are situate.

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
KENT.—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1874	Rural	7,597	545,932	3,914,314	422,580	17,475	7,010	44,764	42,687	3 06	20.2
	Urban	2,152	4,919	1,713,510	321,781	114,988	14,539	41,968	13,870	6 04	27.4
	Total	9,749	550,851	5,627,824	744,361	159,463	32,178	86,732	56,557	3 79	22.5
1875	Rural	7,143	549,352	4,870,198	471,715	66,947	5,168	57,887	40,816	3 45	18.5
	Urban	2,816	5,984	1,664,235	293,632	115,897	9,878	32,306	18,308	4 51	25.8
	Total	9,959	555,336	6,534,433	765,347	226,844	15,046	90,193	59,124	3 75	20.5
1876	Rural	7,499	554,266	9,491,248	620,462	20,322	5,745	62,791	46,106	3 85	10.8
	Urban	2,968	6,042	1,864,588	306,493	122,297	28,338	37,787	27,722	5 55	30.2
	Total	10,467	560,308	11,355,836	926,955	182,619	34,083	100,578	73,828	4 35	14.2
1877	Rural	7,872	555,765	9,468,946	587,587	39,435	111	61,922	44,705	3 64	10.6
	Urban	3,235	6,443	2,112,532	301,030	120,597	32,171	34,148	29,031	5 07	26.2
	Total	11,107	562,208	11,581,478	888,617	195,032	32,282	96,070	73,736	4 07	13.6
1878	Rural	8,153	553,694	9,526,761	532,575	32,444	2,668	60,890	45,060	3 50	10.5
	Urban	3,452	6,522	1,973,753	272,840	128,309	9,087	45,138	27,292	5 59	32.2
	Total	11,605	560,216	11,500,514	805,415	331,456	11,755	106,028	72.352	4 13	14.5
1879	Rural	8,338	552,024	9,451,944	511,838	52,143	5,048	64,139	48,101	3 64	11.3
	Urban	3,829	6,522	3,575,319	240,715	132,260	25,535	38,852	26,626	4 59	17.2
	Total	12,167	558,546	13,027,263	752,553	369,416	46,312	102,991	74,727	3 94	12.9
1880	Rural	8,672	553,613	9,729,336	489,697	32,392	5,526	74,151	49,205	3 91	12.1
	Urban	3,927	6,522	3,640,307	371,840	128,678	7,455	41,374	31,459	4 90	18.1
	Total	12,599	560,135	13,369,643	861,537	337,475	17,981	115,525	80,664	4 23	13.8
1881	Rural	8,820	548,147	9,742,729	492,770	131,345	25,090	72,639	49,701	3 77	11.9
	Urban	3,949	6,522	3,672,347	411,554	130,675	6,972	35,706	32,328	4 66	16.7
	Total	12,769	554,669	13,415,076	904,324	429,475	32,062	108,345	82,029	4 05	13.3
1882	Rural	9,194	549,478	10,400,177	506,613	135,505	47,478	81,365	46,236	4 08	11.7
	Urban	4,031	6,836	4,057,185	410,520	157,577	22,334	45,912	29,170	5 01	16.8
	Total	13,225	556,314	14,457,362	917,133	451,225	69,812	127,277	75,406	4 38	13.2
1883	Rural	8,775	556,584	11,622,722	610,969	117,588	70,414	92,971	52,734	4 71	11.9
	Urban	4,340	6,564	3,871,736	415,725	198,411	31,375	52,375	30,506	5 36	19.3
	Total	13,115	563,148	15,494,458	1,026,694	464,446	101,789	145,346	83,240	4 93	13.8
ELGIN:											
1873	Rural	6,999	438,304	6,849,396	615,545	24,949	.....	68,169	36,371	4 30	14.0
	Urban	447	812	190,110	25,150	7,000	.....	2,447	2,854	3 45	24.6
	Total	7,446	439,116	7,039,506	640,695	224,149	.....	70,616	39,225	4 25	14.3
1874	Rural	7,319	434,422	8,017,130	684,566	25,801	3,799	60,216	43,586	4 20	11.9
	Urban	433	916	296,820	58,910	6,500	.....	2,342	3,053	3 22	15.2
	Total	6,752	435,338	8,313,950	743,476	224,501	3,799	62,558	46,639	4 14	12.1
1875	Rural	7,406	439,003	11,946,802	819,456	16,357	.....	61,296	41,827	3 89	8.1
	Urban	595	1,183	500,600	80,385	12,000	1,331	4,239	4,220	3 74	14.6
	Total	8,001	440,186	12,447,402	899,841	193,757	1,331	65,535	46,047	3 88	8.4
1876	Rural	7,566	434,828	12,148,249	813,765	19,911	.....	54,529	42,357	3 59	7.5
	Urban	751	1,312	538,001	78,000	12,000	500	4,351	5,112	3 72	15.4
	Total	8,317	436,140	12,686,250	891,765	184,511	500	58,880	47,469	3 60	7.8
1877	Rural	7,968	437,803	12,196,707	781,883	11,370	.....	64,744	44,631	3 92	8.4
	Urban	675	1,062	525,708	93,851	11,500	611	4,985	6,011	4 41	17.7
	Total	8,643	438,865	12,722,415	875,734	162,870	611	69,729	50,642	3 96	8.8

TABLE NO. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of—		Bonded Debt.	Floating Debt.	Amount of Taxes levied for—		Rate of Taxation for Municipal and School Purposes—	
				Real Property.	Personal Property.			Municipal Purposes.	School Purposes.	Per head of Population.	Mills on $.
ELGIN:—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1878	Rural	8,150	437,635	12,223,367	797,851	14,356	2,000	75,064	38,249	4 11	8.7
	Urban	918	1,767	651,197	70,783	9,700	3,397	6,410	7,236	3 96	18.9
	Total	9,068	439,472	12,874,557	868,634	152,056	5,397	81,474	45,485	4 09	9.2
1879	Rural	8,178	437,459	12,300,168	740,269	14,882	2,453	66,436	39,331	3 81	8.1
	Urban	908	1,812	626,076	76,695	9,500	254	5,844	6,395	3 51	17.4
	Total	9,086	439,271	12,926,244	816,964	159,382	12,707	72,280	45,726	3 77	8.5
1880	Rural	8,154	435,271	12,324,422	729,644	23,790	2,345	63,854	39,109	3 66	7.9
	Urban	929	1,774	613,986	63,395	7,700	2,989	5,392	7,235	4 08	18.6
	Total	9,083	437,045	12,938,408	793,039	151,490	15,334	69,246	46,344	3 70	8.4
1881	Rural	8,164	435,960	12,403,224	693,004	21,845	2,253	69,263	39,405	4 00	8.3
	Urban	881	1,750	608,183	80,309	7,700	871	5,950	7,619	4 48	19.7
	Total	9,045	437,710	13,011,407	773,313	133,545	53,482	75,213	47,024	4 05	8.8
1882	Rural	8,141	434,986	12,378,916	741,211	25,070	1,033	73,853	37,896	4 32	8.5
	Urban	979	2,693	617,833	83,460	10,000	269	6,122	6,445	3 91	17.9
	Total	9,120	437,679	12,996,749	824,671	125,070	46,559	79,975	44,341	4 27	9.0
1883	Rural	8,052	435,254	12,530,197	745,517	30,316	9,879	81,480	41,528	4 69	9.3
	Urban	888	2,782	648,633	98,685	20,000	.....	5,822	7,313	4 28	17.6
	Total	8,940	438,036	13,178,830	844,202	130,316	31,208	87,302	48,841	4 64	9.7
NORFOLK:											
1873	Rural	6,256	385,457	4,494,861	423,985	51,036	8,000	35,543	34,808	2 79	14.3
	Urban	623	400	407,605	98,830	3,000	.....	3,798	2,257	3 54	12.0
	Total	6,879	385,857	4,902,466	522,815	56,036	8,000	39,341	37,065	3 03	14.1
1874	Rural	6,965	386,813	4,668,663	372,636	24,456	.....	36,741	35,863	2 76	14.4
	Urban	717	400	419,035	114,900	3,000	10,000	4,005	3,125	3 54	13.3
	Total	7,682	387,213	5,087,698	487,536	28,456	10,000	40,746	38,988	2 82	14.3
1875	Rural	6,811	369,639	5,695,067	429,375	59,242	1,502	37,960	35,551	2 80	12.0
	Urban	747	400	442,910	108,060	13,731	.....	6,198	2,960	4 68	16.6
	Total	7,558	370,039	6,137,977	537,435	72,973	1,502	44,158	38,511	2 94	12.4
1876	Rural	6,678	376,828	6,355,215	669,519	45,699	.....	39,582	41,831	3 09	11.6
	Urban	750	400	538,845	27,440	13,104	.....	7,786	2,729	5 13	18.6
	Total	7,428	377,228	6,894,060	696,959	58,803	.....	47,368	44,560	3 24	12.1
1877	Rural	6,849	395,622	6,306,197	600,907	58,648	.....	36,675	39,854	2 82	11.1
	Urban	781	400	460,845	66,285	13,104	3,000	7,248	2,943	3 46	19.3
	Total	7,630	396,022	6,767,042	667,192	71,752	7,000	43,923	42,797	2 88	11.7
1878	Rural	6,891	395,495	7,497,691	571,849	55,225	.....	39,696	39,006	3 02	9.8
	Urban	1,057	1,169	937,889	170,629	22,817	.....	12,340	3,909	4 12	14.7
	Total	7,948	396,664	8,435,580	742,478	78,042	.....	52,036	42,915	3 16	10.3
1879	Rural	6,631	391,747	7,385,765	521,119	43,560	200	36,898	34,618	2 84	9.0
	Urban	1,461	1,631	1,113,942	192,796	22,300	11,000	11,203	6,680	3 81	13.7
	Total	8,092	393,378	8,499,707	713,915	65,860	11,200	48,101	41,298	2 99	9.7
1880	Rural	6,840	391,443	7,571,835	559,461	43,198	2,717	34,426	36,201	2 72	8.7
	Urban	1,498	1,735	1,250,639	177,954	22,300	3,486	14,053	7,555	4 71	15.1
	Total	8,338	393,178	8,822,474	737,415	65,498	6,203	48,479	43,756	3 01	9.6
1881	Rural	6,721	393,799	7,670,542	546,782	48,756	4,314	34,853	33,683	2 69	8.3
	Urban	1,493	1,745	1,154,497	208,680	27,200	6,000	16,214	6,532	4 87	16.7
	Total	8,214	395,544	8,825,039	755,462	75,956	16,768	51,067	40,215	3 02	9.5

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes — Per head of Population.	Rate of Taxation for Municipal and School Purposes — Mills on $.
NORFOLK:—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1882	Rural	6,984	390,630	7,649,225	545,735	44,275	709	34,145	37,183	2 85	8.7
	Urban	1,497	1,722	1,177,735	199,194	33,200	5,512	17,098	6,611	4 57	17 2
	Total	8,481	392,352	8,826,960	744,929	77,475	11,763	51,243	43,794	3 14	9.9
1883	Rural	6,847	391,390	7,993,333	592,520	16,700	1,548	34,003	36,674	2 97	8.3
	Urban	1,542	1,682	1,200,190	189,746	43,300	5,000	16,109	7,437	4 44	16.9
	Total	8,389	393,072	9,193,523	782,266	60,000	11,380	50,112	44,111	3 24	9.4
HALDIMAND:											
1873	Rural	4,311	280,113	3,357,948	408,690	5,614	.....	30,313	35,482	3 74	17.5
	Urban	887	2,362	505,564	70,795	17,700	.....	11,721	5,400	4 73	29.7
	Total	5,198	282,475	3,863,512	479,485	115,314	.....	42,034	40,882	3 91	19.1
1874	Rural	4,510	280,821	3,415,315	385,037	9,974	50	26,006	33,992	3 35	15.8
	Urban	941	2,363	513,155	60,400	17,000	4,634	10,939	5,325	4 25	28.4
	Total	5,451	283,184	3,928,470	445,437	136,974	4,684	36,945	39,317	3 51	17.4
1875	Rural	4,425	277,760	6,215,804	515,184	6,624	2,035	25,323	26,980	2 83	7.8
	Urban	1,240	2,336	531,030	64,625	21,300	.....	8,935	6,039	4 07	25.1
	Total	5,665	280,096	6,746,834	579,809	134,924	2,035	34,258	33,019	3 03	9.2
1876	Rural	4,666	278,197	6,309,649	575,102	7,721	.....	32,339	24,882	3 15	8.3
	Urban	1,059	2,230	534,425	64,325	22,790	.....	10,291	6,145	4 41	27.4
	Total	5,725	280,427	6,844,074	639,427	138,511	.....	42,630	31,027	3 37	9.8
1877	Rural	4,741	278,728	6,346,807	502,675	6,958	.....	31,200	26,396	3 07	8.4
	Urban	1,038	2,346	523,824	63,480	26,280	.....	8,398	10,870	5 17	32.8
	Total	5,779	281,074	6,870,631	566,155	143,238	.....	39,598	37,266	3 41	10.3
1878	Rural	4,935	278,867	7,010,747	535,041	12,856	100	38,715	25,497	3 48	8.5
	Urban	979	2,421	732,445	102,180	22,270	.....	8,403	7,224	4 27	18.7
	Total	5,914	281,288	7,743,192	637,221	138,126	100	47,118	32,721	3 61	9.5
1879	Rural	4,994	280,513	6,882,459	565,904	14,777	.....	37,655	26,265	3 45	8.6
	Urban	1,039	2,374	737,114	106,535	21,260	5,921	10 443	6,949	4 75	20.6
	Total	6,033	282,887	7,619,573	672,439	132,037	5,921	48,098	33,214	3 66	9.8
1880	Rural	4,985	276,831	7,051,863	482,964	12,743	1,341	35,147	28,437	3 48	8.4
	Urban	968	2,253	774,292	113,366	19,500	2,500	8,067	7,803	4 69	17.9
	Total	5,953	279,084	7,826,155	596,330	120,243	3,841	43,214	36,240	3 67	9.4
1881	Rural	4,954	280,350	6,980,184	517,981	10,881	1,315	34,726	27,947	3 43	8.4
	Urban	997	2,408	775,401	98,770	20,230	2,781	6,857	7,642	4 20	16.6
	Total	5,951	282,758	7,755,585	616,751	109,111	4,096	41,583	35,589	3 55	9.2
1882	Rural	5,059	280,613	6,927,848	506,401	17,830	.....	33,157	30,172	3 50	8.5
	Urban	929	2,429	763,391	88,495	19,080	.....	8,146	7,462	4 67	18.3
	Total	5,988	283,042	7,691,239	594,896	109,910	.....	41,303	37,634	3 68	9.5
1883	Rural	4,983	281,236	6,967,423	527,290	16,240	2,087	34,294	30,019	3 66	8.6
	Urban	996	2,404	768,146	102,800	16,300	.....	8,197	6,826	4 58	17.2
	Total	5,979	283,640	7,735,569	630,090	100,540	2,087	42,491	36,845	3 81	9.5
WELLAND:											
1873	Rural	4,251	220,568	4,190,189	384,573	2,508	.....	16,691	27,628	2 78	9.7
	Urban	2,048	3,354	1,515,231	346,790	.....	.....	15,312	10,569	3 46	13.9
	Total	6,299	223,922	5,705,420	731,363	2,508	.....	32,003	38,197	3 00	10.9
1874	Rural	4,503	221,496	4,342,456	369,806	3,171	.....	16,766	28,294	2 84	9.8
	Urban	1,956	3,331	1,524,774	343,573	3,000	.....	12,927	14,796	3 44	14.8
	Total	6,459	224,827	5,867,230	713,379	6,171	.....	29,693	43,090	3 04	11.2

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
WELLAND.—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1875	Rural	4,478	220,680	4,764,767	416,005	2,000	.....	25,251	27,104	3 19	10.1
	Urban	2,461	3,440	1,891,328	365,164	3,000	.....	18,691	10,972	3 68	13.1
	Total	6,939	224,120	6,656,095	781,169	5,000	.....	43,942	38,076	3 35	11.0
1876	Rural	4,785	219,686	4,732,058	467,386	1,369	1,500	25,275	25,127	2 86	9.7
	Urban	2,368	3,552	2,040,472	364,838	6,500	618	26,906	14,368	4 05	17.2
	Total	7,153	223,238	6,772,530	832,224	7,869	2,118	52,181	39,495	3 30	12.1
1877	Rural	4,828	221,247	4,611,325	368,144	9,328	.....	22,860	26,410	2 86	9.9
	Urban	2,370	3,429	2,076,336	504,487	13,750	.....	23,858	12,371	3 46	14.0
	Total	7,198	224,676	6,687,661	872,631	23,078	.....	46,718	38,781	3 09	11.2
1878	Rural	4,956	220,306	4,792,996	385,904	1,282	500	22,532	24,106	2 53	9.0
	Urban	2,681	3,711	2,248,673	402,145	12,276	.....	25,535	16,540	3 82	15.9
	Total	7,637	224,017	7,041,669	788,049	13,558	500	48,067	40,646	3 01	11.3
1879	Rural	5,131	220,865	5,667,718	373,929	1,576	.....	24,239	26,115	2 62	8.3
	Urban	2,704	3,848	2,250,440	364,892	36,508	.....	23,428	12,041	3 28	13.6
	Total	7,835	224,713	7,918,158	738,821	38,084	.....	47,667	38,156	2 86	9.9
1880	Rural	5,093	221,255	5,244,174	359,575	1,732	4,500	29,402	25,514	2 92	9.8
	Urban	2,833	3,500	2,215,140	312,460	39,558	.....	22,449	16,911	3 94	15.6
	Total	7,926	224,755	7,459,314	672,035	41,290	4,500	51,851	42,425	3 27	11.6
1881	Rural	5,152	223,350	6,296,764	550,045	3,236	.....	25,849	28,790	2 87	8.0
	Urban	2,598	3,865	2,237,939	403,765	36,819	3,398	17,948	12,341	3 26	11.5
	Total	7,750	227,215	8,534,703	953,810	40,055	3,398	43,797	41,131	3 00	8.9
1882	Rural	5,027	220,403	6,457,899	568,772	2,383	.....	25,074	24,251	2 81	7.0
	Urban	2,907	4,095	2,664,029	379,771	42,631	7,500	22,805	16,068	4 04	12.8
	Total	7,934	224,498	9,121,928	948,543	45,014	7,500	47,879	40,310	3 24	8.8
1883	Rural	4,975	226,580	6,513,056	571,703	4,000	.....	21,478	22,425	2 57	6.2
	Urban	2,968	3,968	2,803,815	353,765	47,585	6,190	27,156	20,181	4 76	15.0
	Total	7,943	230,548	9,316,871	925,468	51,585	6,190	48,634	42,606	3 37	8.9
LAMBTON:											
1873	Rural	6,995	660,216	4,431,978	568,926	29,621	5,954	51,391	53,250	3 81	20.9
	Urban	1,633	6,020	1,097,309	337,025	57,200	4,000	22,654	9,982	4 45	22.7
	Total	8,628	666,236	5,529,287	905,951	106,821	9,954	74,045	63,232	3 95	21.3
1874	Rural	6,988	660,648	4,336,246	501,476	38,297	11,593	48,729	50,212	3 51	20.4
	Urban	2,144	6,915	1,326,725	340,630	44,039	5,825	27,009	15,757	4 41	25.6
	Total	9,132	667,563	5,662,971	842,106	107,255	17,918	75,738	65,969	3 74	21.8
1875	Rural	7,051	661,389	4,720,968	502,703	40,241	32,917	59,880	49,778	3 81	21.0
	Urban	2,234	6,911	1,377,718	380,751	31,230	33,171	30,307	14,552	4 86	25.5
	Total	9,285	668,300	6,098,686	883,454	86,471	66,088	90,187	64,330	4 06	22.1
1876	Rural	7,445	659,299	5,544,179	530,835	65,481	2,499	54,154	50,929	3 49	17.3
	Urban	2,384	6,908	1,464,071	404,389	102,477	5,937	34,092	13,531	4 80	25.5
	Total	9,829	666,207	7,008,250	935,224	200,214	8,436	88,246	64,460	3 82	19.2
1877	Rural	7,959	665,247	8,274,464	753,810	89,309	80	64,936	52,737	3 69	13.0
	Urban	2,805	7,413	1,713,044	378,886	131,077	9,093	32,611	17,674	4 37	24.0
	Total	10,764	672,660	9,987,508	1,132,696	239,186	9,173	97,547	70,411	3 87	15.1
1878	Rural	8,283	662,626	8,622,836	776,310	75,079	.....	67,472	51,115	3 80	12.6
	Urban	3,277	7,798	1,894,123	406,898	137,573	5,026	39,463	17,209	4 64	24.6
	Total	11,560	670,424	10,516,959	1,183,208	226,652	5,026	106,935	68,324	4 03	15.0

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $
				$	$	$	$	$	$	$ c.	Mills.
Lambton.—*Continued.*											
1879	Rural	8,361	661,939	8,386,446	754,698	118,964	17,984	61,958	51,309	3 69	12.4
	Urban	3,354	7,648	2,102,463	346,606	26,502	557	38,678	20,513	4 39	24.2
	Total	11,715	669,587	10,488,909	1,101,304	157,466	18,541	100,636	71,822	3 91	14.9
1880	Rural	8,442	664,566	8,700,069	647,793	99,074	26,879	79,329	58,404	4 45	14.7
	Urban	3,557	7,631	2,220,180	330,826	130,254	7,339	36,484	20,610	4 07	22.4
	Total	11,999	672,197	10,920,249	978,619	231,328	34,218	115,813	79,014	4 33	16.4
1881	Rural	8,406	661,651	8,722,871	682,053	85,127	22,639	73,849	55,769	4 22	13.8
	Urban	3,848	8,131	2,257,182	306,477	138,484	10,769	35,935	20,987	3 83	22.2
	Total	12,254	669,782	10,980,053	988,530	230,867	33,408	109,784	76,756	4 09	15.6
1882	Rural	8,491	643,085	10,116,459	715,235	82,106	40,005	75,726	59,227	4 43	12.5
	Urban	4,194	9,571	2,585,338	308,673	151,650	10,966	47,268	22,060	4 59	24.0
	Total	12,685	652,656	12,701,797	1,023,908	240,384	50,971	122,994	81,287	4 48	14.9
1883	Rural	8,577	641,821	11,788,160	798,087	143,807	6,872	79,157	60,765	4 69	11.1
	Urban	4,541	9,949	2,771,808	336,308	185,905	24,888	54,727	31,955	5 47	27.9
	Total	13,118	651,770	14,559,968	1,134,395	335,712	31,760	133,884	92,720	4 96	14.4
Huron:											
1873	Rural	10,633	803,587	8,040,991	493,910	239,413	4,044	98,481	79,512	3 57	20.8
	Urban	2,041	3,533	1,529,721	279,320	87,532	.....	21,264	13,456	3 56	19.2
	Total	12,674	807,120	9,570,712	773,230	589,208	4,044	119,745	92,968	3 56	20.6
1874	Rural	10,988	791,332	8,883,505	562,733	195,800	.....	91,922	88,364	3 47	19.1
	Urban	2,716	3,990	1,757,929	275,940	91,032	.....	26,000	21,896	4 35	23.5
	Total	13,704	795,322	10,641,434	838,673	569,095	.....	117,922	110,260	3 63	19.9
1875	Rural	10,555	790,260	22,060,106	1,277,851	182,100	.....	120,578	81,738	3 93	8.7
	Urban	3,522	4,591	2,515,792	478,485	100,632	3,958	32,003	19,961	3 83	17.3
	Total	14,077	794,851	24,575,898	1,756,336	562,612	3,958	152,581	101,699	3 91	9.7
1876	Rural	10,822	790,638	22,752,151	1,139,693	174,840	900	104,958	79,593	3 59	7.7
	Urban	3,729	6,349	2,831,769	521,696	119,808	4,933	34,756	23,078	3 99	17.2
	Total	14,551	796,987	25,583,920	1,661,389	579,648	5,833	139,714	102,671	3 67	8.9
1877	Rural	11,163	793,458	23,588,562	1,157,119	168,700	1,089	106,198	81,375	3 64	7.6
	Urban	4,246	6,876	3,195,679	509,130	127,256	3,235	39,763	26,435	3 93	17.9
	Total	15,409	800,334	26,784,241	1,666,249	580,956	4,324	145,961	107,810	3 71	8.9
1878	Rural	12,088	792,308	23,561,163	1,107,744	157,918	300	110,958	80,534	3 72	7.8
	Urban	4,649	6,819	3,444,808	478,279	179,426	.....	39,128	31,721	4 24	18.1
	Total	16,737	799,127	27,005,971	1,586,023	622,344	300	150,086	112,255	3 85	9.2
1879	Rural	12,433	793,360	23,815,958	1,130,857	153,950	.....	103,819	74,775	3 46	7.2
	Urban	4,972	7,024	3,410,495	439,194	172,790	16,082	40,650	32,094	4 34	18.9
	Total	17,405	800,384	27,226,453	1,570,051	611,740	16,082	144,469	106,869	3 68	8.7
1880	Rural	12,336	793,292	23,805,204	1,050,210	173,040	.....	103,879	73,057	3 47	7.1
	Urban	4,993	7,031	3,415,852	450,309	188,006	6,254	43,557	24,899	4 15	17.7
	Total	17,329	800,323	27,221,056	1,500,519	646,046	6,254	147,436	97,956	3 64	8.5
1881	Rural	12,554	795,226	24,112,901	1,118,917	151,604	.....	108,570	73,434	3 57	7.2
	Urban	4,592	7,011	3,421,469	457,640	190,024	.....	44,797	24,641	4 21	17.9
	Total	17,146	802,237	27,534,370	1,576,557	626,628	.....	153,367	98,075	3 72	8.6
1882	Rural	12,852	789,427	24,544,268	1,171,270	135,168	2,697	100,687	74,358	3 43	6.8
	Urban	4,260	6,953	3,454,173	434,200	143,800	3,256	48,713	27,060	4 59	19.5
	Total	17,112	796,380	27,998,441	1,605,470	563,968	5,953	149,400	101,418	3 71	8.5

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
				$	$	$	$	$	$	$ c.	Mills.
HURON—*Continued.*											
1883	Rural	12,722	796,257	24,635,452	1,252,654	170,132	6,312	116,118	75,021	3 86	7.4
	Urban	4,358	6,942	3,437,454	444,535	179,284	3,415	47,170	27,467	4 73	19.2
	Total	17,080	803,199	28,072,906	1,697,189	634,416	9,727	163,288	102,488	4 07	8.9
BRUCE:											
1873	Rural	8,323	668,947	6,222,122	582,045	49,767	.....	104,841	52,266	3 98	23.1
	Urban	882	4,042	361,579	129,652	43,900	5,235	6,735	5,159	3 17	24.2
	Total	9,205	672,989	6,583,701	711,697	698,667	5,235	111,576	57,425	3 91	23.2
1874	Rural	8,433	672,966	7,161,860	635,871	53,892	.....	103,842	58,338	4 10	20.8
	Urban	1,127	4,042	443,592	132,001	43,900	8,032	7,620	7,979	3 08	27.1
	Total	9,560	677,008	7,605,452	767,872	542,192	267,232	111,462	66,317	3 98	21.2
1875	Rural	8,426	667,922	12,143,097	919,334	43,310	19,963	92,846	55,077	3 66	11.3
	Urban	2,129	5,812	1,151,872	205,390	51,790	7,108	22,445	14,469	4 36	27.2
	Total	10,555	673,734	13,294,969	1,124,724	491,400	27,071	115,291	69,546	3 78	12.8
1876	Rural	8,786	701,254	13,246,228	935,803	57,231	.....	91,378	65,953	3 80	11.1
	Urban	2,453	5,574	1,570,286	224,899	51,590	5,084	25,457	17,254	4 35	23.8
	Total	11,239	706,828	14,816,514	1,160,702	689,021	5,084	116,835	83,207	3 90	12.5
1877	Rural	8,761	700,754	13,147,028	918,603	59,386	.....	90,990	63,244	3 63	11.0
	Urban	2,580	6,074	1,666,363	232,299	51,590	5,084	26,233	17,755	3 97	23.2
	Total	11,341	706,828	14,813,391	1,150,902	552,976	5,084	117,223	80,999	3 70	12.4
1878	Rural	9,383	728,671	14,587,617	881,865	152,575	.....	96,716	60,431	3 53	10.2
	Urban	2,926	6,605	2,013,325	223,517	74,550	3,371	30,903	19,953	4 42	22.7
	Total	12,309	735,276	16,600,942	1,105,382	621,725	3,371	127,619	80,384	3 71	11.7
1879	Rural	10,005	761,757	16,028,206	845,128	245,764	1,659	102,442	65,630	3 72	10.0
	Urban	3,272	6,937	2,360,287	214,735	97,513	.....	35,574	23,255	5 24	22.8
	Total	13,277	768,694	18,388,493	1,059,863	706,277	1,659	138,016	88,885	4 02	11.7
1880	Rural	9,434	770,873	15,974,251	816,886	153,970	2,050	102,991	64,147	3 87	9.9
	Urban	3,081	7,676	2,502,747	264,753	110,313	28,018	31,672	28,979	4 67	21.9
	Total	12,515	778,549	18,476,998	1,081,639	568,283	30,068	134,663	93,126	4 06	11.6
1881	Rural	9,653	770,370	16,423,264	903,462	197,172	839	96,639	62,522	3 74	9.2
	Urban	3,311	8,602	2,662,290	295,345	64,331	8,682	37,865	24,546	4 51	21.1
	Total	12,964	778,972	19,085,554	1,198,807	590,503	34,083	134,504	87,068	3 93	10.2
1882	Rural	9,619	795,632	16,366,884	1,062,539	203,098	4,311	96,269	62,039	3 77	9.1
	Urban	3,347	9,624	2,642,815	233,237	101,156	18,573	37,090	19,265	4 05	19.6
	Total	12,966	805,256	19,009,699	1,295,776	614,754	22,884	133,359	81,304	3 84	10.6
1883	Rural	9,830	834,245	17,421,095	1,271,755	212,257	10,705	101,299	62,187	3 92	8.7
	Urban	3,572	9,651	2,729,025	379,215	115,493	27,316	41,868	22,064	4 66	20.6
	Total	13,402	843,896	20,150,120	1,650,970	628,250	38,021	143,167	84,251	4 11	10.4
GREY:											
1873	Rural	10,876	1,061,523	6,896,555	595,303	125,932	64,468	94,290	68,197	3 31	21.7
	Urban	1,342	7,300	836,071	247,446	60,250	19,788	16,096	6,261	4 79	20.6
	Total	12,218	1,068,823	7,732,626	842,749	676,409	105,199	110,386	74,458	3 44	21.6
1874	Rural	11,464	1,084,798	7,572,606	587,598	111,333	21,769	83,492	74,316	3 00	19.3
	Urban	1,372	7,300	857,242	266,734	71,250	18,300	22,245	5,534	5 78	24.7
	Total	12,836	1,092,098	8,429,848	854,332	553,650	54,626	105,737	79,850	3 24	20.0
1875	Rural	11,576	1,076,972	8,668,473	733,755	106,797	22,936	102,497	71,724	3 31	18.5
	Urban	1,765	8,720	1,660,447	343,822	87,772	15,000	32,543	10,921	6 69	21.7
	Total	13,341	1,085,692	10,328,920	1,077,577	565,636	49,749	135,040	82,645	3 68	19.1

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of—		Bonded Debt.	Floating Debt.	Amount of Taxes levied for—		Rate of Taxation for Municipal and School Purposes—	
				Real Property.	Personal Property.			Municipal Purposes.	School Purposes.	Per head of Population.	Mills on $.
GREY—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1876	Rural	11,984	1,088,990	8,845,241	674,752	83,018	35,251	99,368	77,233	3 27	18.5
	Urban	1,869	8,900	1,445,951	330,681	91,550	25,846	20,639	8,542	4 46	16.4
	Total	13,853	1,097,890	10,291,192	1,005,433	538,634	77,525	120,007	85,775	3 40	18.2
1877	Rural	12,799	1,101,340	9,487,418	825,071	83,483	30,744	108,535	73,000	3 25	17.6
	Urban	1,874	8,300	1,495,616	322,840	96,486	11,697	24,544	10,227	5 18	19.1
	Total	14,673	1,109,640	10,983,034	1,147,911	566,344	86,953	133,079	83,227	3 46	17.8
1878	Rural	13,633	1,123,661	9,693,218	895,833	247,789	29,647	107,800	76,392	3 25	17.4
	Urban	1,901	9,020	1,509,795	301,512	91,139	2,869	19,234	11,495	4 43	17.0
	Total	15,534	1,132,681	11,203,013	1,197,345	688,095	32,516	127,034	87,887	3 38	17.3
1879	Rural	13,788	1,126,271	10,160,115	736,001	317,593	6,524	129,083	73,483	3 45	18.6
	Urban	2,160	9,525	1,638,122	269,734	140,509	12,237	31,176	12,149	5 60	22.7
	Total	15,948	1,135,796	11,798,237	1,005,735	722,102	18,761	160,259	85,632	3 70	19.2
1880*	Rural	13,159	1,045,918	9,432,496	683,602	336,100	13,374	106,759	75,363	3 25	18.0
	Urban	1,986	9,025	1,573,802	236,832	142,609	24,898	24,439	18,276	5 92	23.6
	Total	15,145	1,054,943	11,006,298	920,434	742,709	38,272	131,198	93,639	3 55	18.8
1881	Rural	13,203	1,036,430	9,879,318	808,483	367,597	11,006	109,236	71,781	3 27	16.9
	Urban	2,008	8,225	1,595,565	249,362	156,910	4,815	26,314	15,085	5 80	22.4
	Total	15,211	1,044,655	11,474,883	1,057,845	580,947	15,821	135,550	86,866	3 56	17.7
1882	Rural	13,223	1,059,645	12,596,700	954,136	348,088	16,838	101,043	73,780	3 19	12.9
	Urban	2,031	8,225	1,670,994	253,515	128,557	31,775	26,833	14,070	5 46	21.2
	Total	15,254	1,067,870	14,267,694	1,207,651	533,085	48,613	127,876	87,850	3 46	13.9
1883	Rural	13,404	1,062,671	12,539,078	1,017,709	358,000	12,460	108,723	75,948	3 42	13.6
	Urban	2,084	8,625	1,710,889	260,015	160,985	4,582	34,110	12,443	6 38	23.6
	Total	15,488	1,071,296	14,249,967	1,277,724	666,865	17,042	142,833	88,391	3 77	14.9
SIMCOE:†											
1873	Rural	11,792	1,162,498	8,008,534	514,183	63,500	1,772	76,412	65,383	2 94	16.6
	Urban	3,190	8,909	1,773,324	324,131	106,664	6,199	29,224	11,813	4 01	19.6
	Total	14,982	1,171,407	9,781,858	838,314	239,164	7,971	105,636	77,196	3 13	17.2
1874	Rural	12,588	1,197,098	8,308,235	505,096	76,200	2,000	80,518	74,360	3 04	17.6
	Urban	3,467	9,037	2,041,942	325,845	90,024	19,148	27,467	11,847	3 39	16.6
	Total	16,055	1,206,135	10,350,177	830,941	213,728	21,148	107,985	86,207	3 10	17.4
1875	Rural	12,435	1,197,128	9,028,263	509,381	120,287	5,436	86,552	75,105	3 18	16.9
	Urban	3,512	9,754	2,407,359	331,729	100,500	25,578	29,905	15,833	3 65	16.7
	Total	15,947	1,206,882	11,435,622	841,110	255,281	31,014	116,457	90,938	3 28	16.9
1876	Rural	12,806	1,220,398	9,669,796	554,039	76,550	26,431	91,112	78,990	3 30	16.6
	Urban	3,872	10,172	2,921,503	358,609	108,500	38,179	32,593	19,886	3 64	16.0
	Total	16,678	1,230,570	12,591,299	912,648	215,665	64,610	123,705	98,876	3 37	16.5
1877	Rural	13,330	1,219,175	11,949,840	702,637	133,650	10,361	90,754	74,094	2 99	13.0
	Urban	3,626	10,139	2,899,237	282,581	226,500	25,060	30,734	22,065	3 85	16.6
	Total	16,956	1,229,314	14,849,077	985,218	429,150	35,421	121,488	96,159	3 16	13.7
1878	Rural	13,905	1,224,698	12,683,545	652,639	200,625	21,371	92,354	73,816	3 01	12.5
	Urban	4,391	11,176	3,321,062	325,755	170,900	14,447	38,710	32,115	4 18	19.4
	Total	18,296	1,235,874	16,004,607	978,394	440,525	35,818	131,064	105,931	3 28	14.0

* Township of Melancthon taken to form part of Dufferin.
† Including portions of Muskoka and Parry Sound.

TABLE No. XXXV.—ASSESSMENT AND TAXATION—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of—		Bonded Debt.	Floating Debt.	Amount of Taxes levied for—		Rate of Taxation for Municipal and School Purposes—	
				Real Property.	Personal Property.			Municipal Purposes.	School Purposes.	Per head of Population.	Mills on $.
SIMCOE—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1879	Rural	14,108	1,230,752	12,728,543	624,154	176,690	13,162	104,011	74,627	3 16	13.4
	Urban	4,217	11,221	3,316,951	307,036	189,700	11,388	40,079	30,214	3 95	19.4
	Total	18,325	1,241,973	16,045,494	931,190	435,390	24,550	144,090	104,841	3 41	14.7
1880*	Rural	12,987	1,129,923	11,948,182	590,676	129,512	23,966	99,216	70,548	3 46	13.5
	Urban	4,080	11,076	3,336,257	284,496	116,013	4,832	43,664	30,235	4 13	20.4
	Total	17,067	1,140,999	15,284,439	875,172	314,525	28,798	142,880	100,783	3 64	15.1
1881	Rural	13,466	1,144,027	12,193,282	591,507	149,444	22,839	99,740	75,659	3 49	13.7
	Urban	3,947	10,675	3,454,842	339,180	166,592	6,299	42,318	38,320	4 60	21.2
	Total	17,413	1,154,702	15,648,124	930,687	385,036	42,653	142,058	113,979	3 78	15.4
1882	Rural	12,571	1,123,381	12,540,578	631,024	110,307	51,991	99,898	71,716	3 47	13.0
	Urban	5,135	12,052	3,779,243	363,200	126,590	17,216	53,450	31,564	4 51	20.5
	Total	17,706	1,135,433	16,319,821	994,224	305,897	69,207	153,348	103,280	3 75	14.8
1883	Rural	13,668	1,142,228	12,687,824	748,348	100,133	30,562	109,177	76,040	3 62	13.8
	Urban	4,748	12,344	3,911,648	392,080	236,598	13,761	49,001	35,155	4 25	19.5
	Total	18,416	1,154,572	16,599,472	1,140,428	405,731	44,323	158,178	111,195	3 80	15.2
MIDDLESEX:											
1873	Rural	12,111	754,718	9,880,049	697,462	10,670	19,949	135,575	82,206	4 52	20.4
	Urban	1,487	4,245	628,169	83,640	38,600	3,188	8,768	16,147	4 17	35.0
	Total	13,598	758,963	10,508,218	781,102	657,303	132,656	144,343	98,353	4 48	21.5
1874	Rural	12,894	754,632	9,999,465	648,166	9,257	22,093	149,224	85,238	4 81	22.0
	Urban	1,595	4,235	694,980	65,780	44,500	900	12,910	21,150	5 00	44.8
	Total	14,489	758,867	10,694,445	713,946	625,707	69,879	162,134	106,388	4 84	23.5
1875	Rural	12,140	753,126	14,575,164	751,544	21,973	23,391	125,130	75,217	4 30	13.1
	Urban	2,839	6,120	1,341,903	77,085	48,986	2,662	18,489	20,040	3 82	27.1
	Total	14,979	759,246	15,917,067	828,629	565,209	114,920	143,619	95,257	4 22	14.3
1876	Rural	12,681	748,580	18,037,442	764,187	24,681	7,279	129,037	72,511	4 27	10.7
	Urban	3,074	6,121	1,789,487	91,025	57,250	3,190	22,583	16,524	3 37	20.8
	Total	15,755	754,701	19,826,929	855,212	545,181	101,893	151,620	89,035	4 09	11.6
1877	Rural	13,223	753,281	18,160,241	664,617	26,849	8,318	134,801	81,843	4 51	11.5
	Urban	3,418	6,226	1,952,546	89,476	63,705	1,920	21,484	19,637	3 28	20.1
	Total	16,641	759,507	20,112,787	754,093	537,004	98,559	156,285	101,480	4 26	12.3
1878	Rural	13,799	752,692	19,115,343	794,487	20,801	5,598	138,420	80,698	4 45	11.0
	Urban	3,739	6,113	2,164,341	94,830	59,134	300	22,864	22,341	3 49	20.0
	Total	17,538	758,805	21,279,684	889,317	497,485	86,008	161,284	103,039	4 26	11.9
1879	Rural	14,054	752,337	20,027,925	784,679	24,462	18,797	131,866	79,210	4 15	10.1
	Urban	3,776	6,090	2,201,503	89,190	68,065	497	23,383	20,343	3 18	19.1
	Total	17,830	758,427	22,229,428	873,869	550,977	82,766	155,249	99,553	3 94	11.0
1880	Rural	13,734	753,315	20,953,124	774,955	31,907	28,921	125,984	77,616	3 85	9.4
	Urban	3,938	6,239	2,255,842	89,572	64,702	1,220	25,383	19,873	3 23	19.3
	Total	17,672	759,554	23,208,966	864,527	616,059	43,785	151,367	97,489	3 72	10.3
1881	Rural	14,221	755,502	21,819,461	753,505	23,670	55,455	128,561	81,406	3 94	9.3
	Urban	4,132	6,172	2,312,552	116,083	76,037	8,364	24,531	30,725	3 95	22.7
	Total	18,353	761,674	24,132,013	869,588	629,157	83,690	153,092	112,131	3 94	10.6

* Townships of Mono and Mulmur taken to form part of Dufferin.

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $
MIDDLESEX—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1882	Rural	14,843	753,085	22,242,290	753,729	30,821	43,460	137,128	84,509	4 18	9.6
	Urban	4,212	6,374	2,517,500	99,230	105,682	10,134	26,720	23,703	3 52	19.3
	Total	19,055	759,459	24,759,790	852,959	683,453	77,128	163,848	108,212	4 04	10.6
1883	Rural	14,826	758,220	22,329,203	725,725	19,309	49,272	135,960	83,287	4 26	9.5
	Urban	4,531	6,255	2,601,162	154,300	111,837	11,231	32,448	23,772	3 63	20.4
	Total	19,357	764,475	24,930,365	880,025	689,896	79,614	168,408	107,059	4 11	10.7
OXFORD:											
1873	Rural	7,340	470,735	9,560,791	1,319,489	50,554	30,338	45,244	54,913	3 06	9.2
	Urban	2,930	6,458	2,123,751	199,850	67,559	13,402	33,479	14,002	4 20	20.4
	Total	10,270	477,193	11,684,542	1,519,339	318,113	43,740	78,723	68,915	3 35	11.2
1874	Rural	7,177	470,990	9,964,360	1,307,729	38,658	30,000	67,716	56,636	3 85	11.0
	Urban	2,792	6,442	2,218,580	177,370	106,223	14,567	33,422	20,602	4 83	22.5
	Total	9,969	477,432	12,182,940	1,485,099	419,881	44,567	101,138	77,238	4 10	13.1
1875	Rural	7,248	471,119	17,674,881	1,482,428	57,564	.....	62,411	55,103	3 61	6.1
	Urban	2,902	6,279	2,497,221	193,700	145,205	5,033	37,517	16,634	4 78	20.1
	Total	10,150	477,398	20,172,102	1,676,128	475,769	5,033	99,928	71,737	3 91	7.9
1876	Rural	7,353	470,735	18,534,168	1,454,247	53,820	2,252	61,037	52,021	3 64	5.7
	Urban	2,999	6,783	2,972,015	242,380	137,221	11,999	36,767	17,090	4 29	16.8
	Total	10,352	477,518	21,506,178	1,696,627	461,141	14,251	97,804	69,111	3 82	7.2
1877	Rural	7,704	467,794	18,986,151	1,472,926	56,200	16,657	60,770	55,110	3 90	5.7
	Urban	3,464	6,711	3,084,929	227,575	140,269	1,400	35,624	18,794	4 04	16.4
	Total	11,168	474,505	22,071,080	1,700,501	465,069	18,057	96,394	73,904	3 94	7.2
1878	Rural	8,156	470,962	19,149,885	1,509,612	47,600	.....	59,429	55,581	3 91	5.6
	Urban	3,727	6,739	3,117,420	229,700	198,933	65,478	34,239	15,003	3 72	14.7
	Total	11,883	477,701	22,267,305	1,739,312	512,633	65,478	93,668	70,584	3 85	6.8
1879	Rural	8,113	470,208	19,215,193	1,395,365	54,358	250	60,129	58,382	3 94	5.7
	Urban	3,880	6,672	3,268,820	262,370	191,673	55,842	41,763	31,921	5 35	20.9
	Total	11,993	476,880	22,484,013	1,657,735	509,631	56,092	101,892	90,303	4 38	8.0
1880	Rural	7,836	469,815	18,997,362	1,294,160	82,484	277	60,717	52,837	3 76	5.6
	Urban	3,383	6,819	3,280,610	256,480	227,573	20,467	43,288	31,367	5 30	21.1
	Total	11,219	476,634	22,277,972	1,550,640	568,157	36,327	104,005	84,204	4 25	7.9
1881	Rural	8,184	471,102	18,959,690	1,324,425	75,730	260	59,422	53,535	3 69	5.6
	Urban	4,463	6,822	3,361,015	278,675	219,243	63,786	42,912	21,028	4 57	17.6
	Total	12,647	477,924	22,320,705	1,603,100	550,073	78,560	102,334	74,563	3 97	7.4
1882	Rural	8,221	466,252	19,034,537	1,349,020	72,250	281	63,927	53,832	3 83	5.8
	Urban	4,514	6,632	3,467,035	272,275	225,798	11,000	45,059	21,778	5 07	17.9
	Total	12,735	472,884	22,501,572	1,621,295	551,948	26,864	108,986	75,610	4 21	7.6
1883	Rural	8,283	470,543	19,226,858	1,414,700	67,920	15,654	85,819	56,294	4 65	6.9
	Urban	5,234	6,829	3,571,075	317,500	230,268	13,000	53,110	22,698	5 38	19.5
	Total	13,517	477,372	22,797,933	1,732,200	546,788	44,343	138,929	78,992	4 88	8.9
BRANT:											
1873	Rural	3,782	216,019	5,554,705	888,515	.....	.....	23,306	26,325	3 21	7.7
	Urban	2,377	2,466	2,933,376	722,382	204,018	7,000	30,633	17,520	4 46	13.2
	Total	6,159	218,485	8,488,081	1,610,897	204,018	7,000	53,939	43,845	3 73	9.7
1874	Rural	3,875	215,605	5,641,362	882,345	.....	.....	26,558	29,804	3 66	8.6
	Urban	2 464	2,466	3,048,873	716,175	199,018	33,059	47,133	20,870	5 89	18.1
	Total	6,339	218,071	8,690,235	1,598,520	199,018	33,059	73,691	50,674	4 62	12.1

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
				$	$	$	$	$	$	$ c.	Mills.
BRANT—*Continued.*											
1875	Rural	3,772	215,355	7,779,318	857,784	31,700	.....	22,882	23,893	3 06	5.4
	Urban	2,560	2,466	3,285,582	755,113	216,519	523	43,786	22,704	5 40	16.4
	Total	6,332	217,821	11,064,900	1,612,897	248,219	523	66,668	46,597	4 11	8.9
1876	Rural	3,938	215,051	8,018,652	843,274	28,085	.....	28,112	25,175	3 35	6.0
	Urban	2,628	2,466	3,423,426	780,382	214,019	.....	44,465	19,236	5 09	15.1
	Total	6,566	217,517	11,442,078	1,623,656	242,104	.....	72,577	44,411	4 12	8.9
*1877	Rural	3,990	216,463	8,499,537	874,670	26,400	.....	33,097	26,519	3 87	6.4
	Urban	827	685	839,402	180,076	.....	.....	9,685	5,405	4 88	14.8
	Total	4,817	217,148	9,338,939	1,054,746	26,400	.....	42,782	31,924	4 04	7.2
1878	Rural	4,183	215,217	8,639,429	912,589	26,938	.....	31,601	23,825	3 52	5.8
	Urban	816	685	833,340	161,092	.....	.....	9,447	5,513	5 07	15.0
	Total	4,999	215,902	9,472,769	1,073,681	26,938	.....	41,048	29,338	3 77	6.7
1879	Rural	4,268	215,644	8,529,265	826,259	25,290	700	26,780	22,582	3 11	5.3
	Urban	855	685	852,606	164,714	.....	.....	7,630	7,343	4 83	14.7
	Total	5,123	216,329	9,381,871	990,973	25,290	700	34,410	29,925	3 39	6.2
1880	Rural	4,318	215,948	8,345,972	753,038	23,130	.....	26,978	21,884	3 03	5.4
	Urban	857	685	873,912	169,024	4,000	900	6,779	6,488	4 28	12.7
	Total	5,175	216,633	9,219,884	922,062	27,130	900	33,757	28,372	3 24	6.1
1881	Rural	4,207	217,531	8,557,133	764,273	21,900	.....	25,115	21,331	2 88	5.0
	Urban	875	685	863,143	151,062	3,697	.....	6,491	6,418	4 22	12.7
	Total	5,082	218,216	9,420,276	915,335	25,597	.....	31,606	27,749	3 09	5.7
1882	Rural	4,113	213,952	8,894,436	811,926	20,610	.....	28,262	26,030	3 37	5.6
	Urban	892	685	881,515	156,195	3,375	6,202	9,858	6,922	5 47	16.2
	Total	5,005	214,637	9,775,951	968,121	23,985	6,202	38,120	32,952	3 71	6.6
1883	Rural	4,303	215,990	9,013,575	975,044	21,852	.....	28,552	25,963	3 37	5.5
	Urban	956	685	908,006	147,095	38,243	8,661	11,606	5,943	4 97	16 6
	Total	5,259	216,675	9,921,581	1,122,139	60,095	8,661	40,158	31,906	3 65	6.5
PERTH:											
1873	Rural	6,507	509,583	8,701,669	361,194	130,500	9,085	89,181	51,396	4 56	15.5
	Urban	2,752	7,936	2,190,715	237,200	178,058	19,902	28,097	18,882	3 41	19.3
	Total	9,259	517,519	10,892,384	598,394	544,058	50,987	117,278	70,278	4 20	16.3
1874	Rural	6,836	518,281	8,662,495	482,037	100,000	15,749	79,276	53,222	4 20	14.5
	Urban	3,207	7,969	2,921,067	245,020	274,620	36,105	37,722	21,599	3 96	18.7
	Total	10,043	526,250	11,583,562	727,057	525,620	58,879	116,998	74,821	4 13	15.6
1875	Rural	6,663	517,240	14,457,637	675,865	115,557	6,768	78,113	47,305	4 13	8.3
	Urban	3,510	7,913	3,211,190	274,940	250,200	15,369	40,592	27,025	4 12	19.4
	Total	10,173	525,153	17,668,827	950,805	548,757	22,137	118,705	74,330	4 13	10.4
1876	Rural	6,622	518,567	14,763,880	601,352	85,300	.....	82,538	48,992	4 08	8.6
	Urban	3,419	8,001	3,984,469	338,294	327,400	15,328	47,801	25,946	4 45	17.1
	Total	10,041	526,568	18,748,349	939,646	667,700	15,328	130,339	74,938	4 21	10.4
1877	Rural	7,405	516,034	15,780,618	683,560	123,227	.....	81,447	52,139	4 18	8.1
	Urban	3,451	6,746	4,396,682	353,000	208,460	13,086	56,559	40,481	5 17	20.4
	Total	10,856	522,780	20,177,300	1,036,560	466,868	43,586	138,006	92,620	4 55	10.9
1878	Rural	7,678	519,879	16,665,854	650,340	132,240	.....	85,466	53,740	4 28	8.0
	Urban	3,727	7,720	4,401,427	359,575	265,445	11,505	61,929	31,891	5 04	19.7
	Total	11,405	527,599	21,067,281	1,009,915	667,857	11,505	147,395	85,631	4 56	10.5

* Brantford becomes a city, and separated from the County.

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
PERTH—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1879	Rural	7,467	519,197	17,895,528	677,215	129,946	.....	84,235	50,728	4 12	7.3
	Urban	3,873	8,331	4,474,275	394,250	348,612	12,110	50,619	27,025	4 21	15.9
	Total	11,340	527,528	22,369,803	1,071,465	739,046	12,110	134,854	77,753	4 16	9.1
1880	Rural	7,298	517,174	17,798,950	716,318	86,482	1,000	90,373	50,046	4 27	7.6
	Urban	3,983	8,167	4,484,214	394,675	420,685	13,637	57,866	32,668	4 86	18.6
	Total	11,281	525,341	22,283,164	1,110,993	764,447	14,637	148,239	82,714	4 48	9.9
1881	Rural	7,548	517,085	17,724,088	708,256	144,300	2,458	84,486	49,144	4 22	7.2
	Urban	4,368	8,646	4,561,040	370,300	418,471	14,169	61,367	31,634	5 20	18.9
	Total	11,916	525,731	22,285,128	1,078,556	816,846	16,627	145,853	80,778	4 57	9.7
1882	Rural	7,472	516,844	17,657,944	685,665	148,639	1,126	87,658	49,591	4 49	7.5
	Urban	4,205	9,727	4,728,345	370,750	411,445	15,679	62,268	28,873	5 18	17.9
	Total	11,677	526,571	22,386,289	1,056,415	888,056	16,805	149,926	78,464	4 74	9.7
1883	Rural	7,419	518,668	17,873,671	812,129	116,976	4,929	87,198	48,132	4 46	7.2
	Urban	4,521	10,114	4,580,106	351,910	452,701	22,233	62,541	26,988	5 12	18.1
	Total	11,940	528,782	22,453,777	1,164,039	800,483	27,162	149,739	75,120	4 70	9.5
WELLINGTON:											
1873	Rural	9,806	766,822	8,854,568	904,043	176,400	.....	91,424	74,670	3 99	17.0
	Urban	3,449	7,199	2,775,738	526,355	154,266	13,043	39,142	21,138	3 88	18.3
	Total	13,255	774,021	11,630,306	1,430,398	439,788	13,043	130,566	95,808	3 96	17.3
1874	Rural	9,850	770,799	8,743,143	974,532	104,500	220	98,774	69,235	3 99	17.3
	Urban	3,910	7,713	2,919,368	542,943	152,833	8,976	48,591	21,438	4 03	20.2
	Total	13,760	778,512	11,662,511	1,517,475	484,142	9,196	147,365	90,673	4 00	18.1
1875	Rural	9,450	769,502	11,210,024	1,131,317	77,800	13,362	91,047	66,224	3 72	12.7
	Urban	4,806	9,158	3,835,326	622,857	216,558	10,457	62,835	42,923	5 36	23.7
	Total	14,256	778,660	15,045,350	1,754,174	519,508	23,819	153,882	109,147	4 24	15.7
1876	Rural	9,600	770,162	12,225,523	1,090,513	77,000	1,186	100,512	68,556	4 04	12.7
	Urban	5,025	10,242	4,169,445	622,533	238,223	12,883	63,977	31,202	4 44	19.9
	Total	14,625	780,404	16,394,968	1,713,046	544,873	14,069	164,489	99,758	4 18	14.6
1877	Rural	10,159	766,841	12,915,204	1,111,476	111,248	.....	109,648	62,455	4 04	12.3
	Urban	5,505	10,246	5,098,967	602,425	233,519	10,873	84,210	28,942	4 95	19.8
	Total	15,664	777,087	18,014,171	1,713,901	579,367	10,873	193,858	91,397	4 35	14.5
1878	Rural	10,631	769,708	13,095,083	992,613	78,050	5,266	110,032	61,290	4 03	12.2
	Urban	6,001	10,517	4,907,298	553,050	320,330	20,222	90,674	52,105	6 40	26.1
	Total	16,632	780,225	18,002,381	1,545,663	602,680	25,488	200,706	113,395	4 79	16.1
*1879	Rural	10 626	769,816	14,065,051	1,023,519	100,350	9,466	115,724	61,941	4 12	11.8
	Urban	3,904	7,444	2,399,342	262,576	250,536	28,551	38,923	22,706	4 66	23.1
	Total	14,530	777,260	16,464,393	1,286,095	554,886	117,681	154,647	84,647	4 24	13.5
†1880	Rural	9,772	663,926	12,917,884	994,394	92,790	2,672	100,548	57,279	4 06	11.3
	Urban	3,497	6,847	2,062,385	229,510	175,005	16,679	35,013	18,990	4 64	23.6
	Total	13,269	670,773	14,980,269	1,223,904	461,995	19,351	135,561	76,269	4 19	13.1
1881	Rural	9,511	663,474	13,468,020	1,054,636	89,165	1,313	97,623	53,742	3 86	10.4
	Uruan	3,435	7,316	2,104,700	239,325	132,155	14,010	31,201	21,790	4 45	22.6
	Total	12,946	670,790	15,572,720	1,293,961	390,020	15,323	128,824	75,532	4 00	12.1

* Guelph becomes a city, separated from the county for municipal purposes.
† Townships of Amaranth and East Garafraxa taken to form part of Dufferin.

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
				$	$	$	$		$	$ c.	Mills.
WELLINGTON—*Continued*											
1882	Rural	9,486	662,650	13,503,752	1,054,080	96,790	2,910	94,241	55,009	3 95	10.2
	Urban	3,479	7,431	2,184,458	210,967	175,062	5,007	33,911	21,708	4 56	23.2
	Total	12,965	670,081	15,688,210	1,265,047	424,752	23,290	128,152	76,717	4 10	12.1
*1883	Rural	9,001	626,314	13,452,701	1,099,841	90,485	6,420	99,047	54,623	4 29	10.6
	Urban	3,179	7,456	2,187,972	242,234	172,579	20,124	34,997	21,560	4 74	23.3
	Total	12,180	633,770	15,640,673	1,342,075	399,764	44,544	134,044	76,183	4 40	12.4
WATERLOO:											
1873	Rural	4,814	306,653	6,246,201	910,527	.....	440	42,439	44,529	3 63	12.1
	Urban	2,759	9,514	2,095,778	545,806	121,586	8,954	28,370	17,893	3 86	17.5
	Total	7,573	316,167	8,341,979	1,456,333	251,586	9,394	70,809	62,422	3 71	13.6
1874	Rural	4,816	306,152	6,239,605	789,464	.....	.....	36,018	45,322	3 39	11.6
	Urban	2,863	9,078	2,134,837	521,351	126,667	6,665	30,832	17,531	4 07	18.2
	Total	7,679	315,230	8,374,442	1,310,815	253,667	11,039	66,850	62,853	3 62	13.4
1875	Rural	4,885	304,849	6,665,721	868,225	.....	400	34,824	45,840	3 24	10.7
	Urban	3,001	9,078	2,204,481	512,622	169,085	5,508	34,292	29,222	4 85	23.4
	Total	7,886	313,927	8,870,202	1,380,847	298,885	10,690	69,116	75,062	3 80	14.1
1876	Rural	4,926	304,849	8,412,490	863,440	.....	120	45,940	43,916	3 66	9.7
	Urban	2,997	9,078	2,258,417	500,308	185,014	7,988	40,009	36,677	5 87	27.8
	Total	7,923	313,927	10,670,907	1,363,748	310,514	12,563	85,949	80,593	4 43	13.8
1877	Rural	5,282	306,974	8,409,853	874,827	.....	112	40,272	43,374	3 42	9.0
	Urban	3,248	9,078	2,378,852	464,623	158,150	29,050	36,046	25,679	4 56	21.7
	Total	8,530	316,052	10,788,705	1,339,450	278,950	33,630	76,318	69,053	3 83	12.0
1878	Rural	5,341	302,597	8,468,103	844,906	.....	124	43,072	42,457	3 47	9.2
	Urban	3,346	9,078	2,511,188	447,567	204,093	14,277	40,169	25,567	4 82	22.2
	Total	8,687	311,675	10,979,291	1,292,473	321,193	18,804	83,241	68,024	3 95	12.3
1879	Rural	5,525	306,565	8,443,706	821,259	.....	830	44,636	43,523	3 54	9.5
	Urban	3,400	9,078	2,607,377	450,743	152,777	12,692	39,684	24,016	4 69	20.8
	Total	8,925	315,643	11,051,083	1,272,002	267,977	17,932	84,320	67,539	3 94	12.3
1880	Rural	5,436	306,234	8,514,940	807,819	.....	1,063	46,035	42,257	3 54	9.5
	Urban	3,355	9,078	2,674,523	424,523	148,591	13,892	39,664	22,460	4 53	20.0
	Total	8,791	315,312	11,189,463	1,232,342	254,491	19,400	85,699	64,717	3 89	12.1
1881	Rural	5,453	307,036	8,533,491	809,492	69,000	984	50,881	41,905	3 65	9.9
	Urban	3,625	8,742	2,768,958	508,667	177,767	5,468	44,732	25,892	4 98	21.5
	Total	9,078	315,778	11,302,449	1,318,159	348,067	10,852	95,613	67,797	4 13	12.9
1882	Rural	5,526	303,305	8,571,744	878,643	8,756	.....	49,537	42,823	3 63	9.8
	Urban	3,653	8,792	2,864,953	519,952	172,251	3,783	47,200	27,110	5 06	21.9
	Total	9,179	312,097	11,436,697	1,398,595	281,307	3,783	96,737	69,933	4 16	13.0
1883	Rural	5,592	305,930	8,485,609	840,435	8,000	2,643	51,132	44,245	3 72	10.2
	Urban	3,928	8,936	3,013,054	538,050	151,783	4,073	47,359	28,497	4 85	21.4
	Total	9,520	314,866	11,498 663	1,378,485	250,383	11,116	98,491	72,742	4 15	13.3

* Township of East Luther annexed to Dufferin.

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
				$	$	$	$	$	$	$ c.	Mills.
DUFFERIN:*											
1880	Rural	3,308	315,394	2,796,785	151,700	68,050	3,924	35,445	18,156	3 72	18.2
	Urban	998	2,300	544,324	26,450	49,500	10,710	8,437	4,744	4 07	23.1
	Total	4,306	317,694	3,341,109	178,150	137,050	14,634	43,882	22,900	3 79	19.0
1881	Rural	3,254	312,335	3,812,913	188,860	58,426	23,000	28,596	18,563	3 25	11.8
	Urban	1,067	2,300	596,060	48,590	59,237	7,892	8,222	4,601	4 03	19.9
	Total	4,321	314,635	4,408,973	237,450	148,263	30,892	36,818	23,164	3 38	12.9
1882	Rural	3,492	313,012	3,705,475	170,700	89,450	1,000	29,343	18,063	3 23	12.2
	Urban	1,084	2,300	467,090	54,040	52,500	.....	6,562	5,895	3 99	23.9
	Total	4,576	315,312	4,172,555	224,740	171,450	1,000	35,905	23,958	3 37	13.6
1883	Rural	3,895	356,212	4,241,558	214,500	80,606	14,763	31,590	22,401	3 49	12.1
	Urban	1,096	2,300	590,905	54,550	55,000	17,111	7,985	7,749	4 95	24.4
	Total	4,991	358,512	4,832,463	269,050	164,306	52,671	39,575	30,150	3 74	13.7
LINCOLN:											
1873	Rural	4,040	191,880	4,284,723	327,980	.....	.....	21,247	30,045	3 10	11.1
	Urban	3,060	3,355	2,523,647	617,423	305,146	31,852	50,894	17,519	6 08	21.8
	Total	7,100	195,235	6,808,370	945,403	306,457	31,852	72,141	47,564	4 30	15.4
1874	Rural	4,167	190,172	4,152,206	376,370	500	.....	24,807	27,718	3 23	11.6
	Urban	3,934	3,587	3,538,330	974,114	309,259	29,000	60,582	19,561	6 06	20.5
	Total	8,101	193,759	7,690,536	1,350,484	309,759	29,000	85,389	47,279	4 49	14.7
1875	Rural	4,357	192,343	4,561,596	435,168	500	678	24,346	28,671	3 18	10.6
	Urban	3,607	3,772	3,822,725	966,982	320,643	18,977	58,925	23,169	6 00	17.1
	Total	7,964	196,115	8,384,321	1,402,150	321,143	19,655	83,271	51,840	4 45	13.8
†1876	Rural	3,868	192,223	4,582,665	346,852	.....	.....	29,879	25,243	3 40	11.2
	Urban	1,400	1,879	802,770	72,737	.....	.....	7,645	7,386	2 95	17.2
	Total	5,268	194,102	5,385,435	419,589	.....	.....	37,524	32,629	3 27	12.1
1877	Rural	4,052	189,075	4,518,372	328,932	.....	.....	28,639	24,856	3 21	11.0
	Urban	1,377	1,887	848,469	73,267	.....	.....	8,430	7,483	2 97	17.3
	Total	5,429	190,962	5,366,841	402,199	.....	.....	37,069	32,339	3 15	12.0
1878	Rural	4,098	191,820	4,475,725	296,788	.....	.....	27,844	24,920	3 17	11.1
	Urban	1,327	1,837	868,350	71,586	.....	.....	7,244	9,136	3 05	17.4
	Total	5,425	193,657	5,344,075	368,374	.....	.....	35,088	34,056	3 14	12.1
1879	Rural	4,115	189,873	4,437,122	265,243	.....	.....	26,244	23,128	3 09	10.5
	Urban	1,436	2,348	976,483	82,183	.....	.....	6,563	10,344	2 70	16.0
	Total	5,551	192,221	5,413,605	347,426	.....	.....	32,807	33,472	2 98	11.5
1880	Rural	4,152	191,068	4,464,004	280,122	155	1,787	28,918	22,486	3 52	10.8
	Urban	1,569	2,489	973,093	73,031	13,594	350	8,944	9,947	3 42	18.1
	Total	5,721	193,557	5,437,097	353,153	13,749	2,137	37,862	32,433	3 49	12.1
1881	Rural	4,142	191,434	4,392,353	265,843	155	.....	27,586	22,966	3 48	10.9
	Urban	1,643	2,500	1,003,874	94,945	16,048	1,580	8,970	11,030	3 65	18.2
	Total	5,785	193,934	5,396,227	360,788	16,203	1,580	36,556	33,996	3 53	12.2
1882	Rural	4,249	188,732	4,453,801	302,431	.....	2,059	29,397	23,749	3 68	11.2
	Urban	1,474	2,548	1,028,697	82,910	12,505	2,070	11,529	11,210	4 18	20.5
	Total	5,723	191,280	5,482,498	385,341	12,505	4,129	40,926	34,959	3 82	12.9

* Organized out of portions of Wellington, Grey and Simcoe; and East Luther (from Wellington added in 1883.

† St. Catharines becomes a city, and separated from the County.

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of—		Bonded Debt.	Floating Debt.	Amount of Taxes levied for—		Rate of Taxation for Municipal and School Purposes—	
				Real Property.	Personal Property.			Municipal Purposes	School Purposes.	Per head of Population.	Mills on $.
LINCOLN.—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1883	Rural	4,249	189,312	4,453,801	302,431	.....	2,059	29,397	24,474	3 79	11.3
	Urban	1,474	2,753	1,028,697	82,910	12,505	2,070	11,529	9,887	3 76	19.3
	Total	5,723	192,065	5,482,498	385,341	12,505	4,129	40,926	34,361	3 78	12.8
WENTWORTH:											
1873	Rural	5,671	271,646	5,732,866	614,725	1,000	.....	33,310	43,567	3 46	12.1
	Urban	913	1,550	672,210	110,940	48,000	4,942	3,133	4,898	2 20	10.2
	Total	6,584	272,196	6,405,076	725,665	107,000	5,062	36,443	48,465	3 28	11.9
1874	Rural	5,902	271,413	5,719,077	556,924	.....	.....	34 738	47,583	3 66	13.1
	Urban	1,006	1,550	992,682	163,460	33,500	12,274	6,359	5,152	2 86	10.0
	Total	6,908	271,963	6,711,759	720,384	113,500	12,313	41,097	52,735	3 54	12.6
1875	Rural	6,127	272,121	9,046,616	868,199	1,000	729	41,790	40,306	3 46	8.3
	Urban	1,051	550	1,040,260	214,350	26,600	2,001	15,055	5,298	5 17	16.2
	Total	7,178	272,671	10,086,876	1,082,459	107,600	2,730	56,845	45,604	3 66	9.2
1876	Rural	6,182	270,629	9,042,671	787,791	.....	.....	46,467	39,758	3 62	8.8
	Urban	1,085	550	1,052,952	168,290	23,900	2,916	10,991	3,736	3 67	12.0
	Total	7,267	271,179	10,095,623	956,081	103,900	2,916	57,458	43,494	3 63	9.1
1877	Rural	6,408	271,573	9,003,066	749,004	.....	1,235	44,340	33,625	3 20	8.0
	Urban	1,051	550	1,019,455	130,676	23,000	3,727	8,051	5,482	3 75	11.8
	Total	7,459	272,123	10,022,521	879,680	103,000	4,962	52,391	39,107	3 27	8.4
1878	Rural	6,408	270,979	9,406,777	703,764	.....	.....	45,024	32,233	3 23	7.6
	Urban	1,079	550	984,962	118,270	23,785	9,088	7,723	5,695	3 68	12.2
	Total	7,487	271,529	10,391,739	822,034	103,785	9,088	52,747	37,928	3 29	8.1
1879	Rural	6,301	271,717	9,239,371	629,321	5,500	.....	44,935	30,674	3 29	7.6
	Urban	1,274	862	1,074,392	109,620	27,486	5,709	8,047	5,108	3 08	11.1
	Total	7,575	272,579	10,313,763	738,941	172,986	5,709	52,982	35,782	3 26	8.0
1880	Rural	6,467	272,042	9,247,152	630,304	5,500	159	42,417	29,770	2 91	7.3
	Urban	1,268	950	1,063,630	115,270	26,794	4,395	9,018	6,849	3 70	13.5
	Total	7,735	272,992	10,310,782	745,574	183,294	4,554	51,435	36,619	3 03	8.0
1881	Rural	6,436	272,069	9,574,480	636,810	5,334	744	35,223	31,764	2 71	6.6
	Urban	1,339	880	1,034,970	125,712	25,101	4,345	10,891	7,803	4 23	16.1
	Total	7,775	272,949	10,609,450	762,522	181,435	5,089	46,114	39,567	2 94	7.5
1882	Rural	6,530	271,534	9,607,483	662,876	4,167	3,207	36,943	29,693	2 76	6.5
	Urban	1,296	950	1,058,655	122,941	22,709	12,419	11,804	7.549	4 06	16.4
	Total	7,826	272,484	10,666,138	785,817	157,876	15,626	48,747	37,242	2 98	7.5
1883	Rural	6,722	273,458	11,090,988	699,854	4,000	718	35,947	30,319	2 80	5.6
	Urban	1,373	890	1,070,475	127,250	56,016	6,815	19,106	8,395	5 64	23.0
	Total	8,095	274,348	12,161,463	827,104	178,516	15,852	55,053	38,714	3 28	7.2
HALTON:											
1873	Rural	3,588	223,314	4,452,141	685,330	.....	.....	21,905	28,045	3 13	9.7
	Urban	906	3,009	678,870	102,800	32,500	.....	9,795	4,524	3 68	18.3
	Total	4,494	226,323	5,131,011	788,130	172,500	.....	31,700	32,569	3 23	10.9
1874	Rural	3,521	227,824	4,251,374	558,615	.....	.....	21,037	26,011	3 18	9.8
	Urban	1,360	3,997	931,609	170,163	44,400	3,061	12,780	6,450	3 43	17.4
	Total	4,881	231,821	5,182,983	728,778	149,400	3,061	33,817	32,461	3 25	11.2
1875	Rural	3,743	223,915	4,454,435	523,706	.....	.....	21,537	23,013	2 99	8.9
	Urban	1,409	3,902	1,046,499	191,715	43,400	6,350	12,825	9,620	3 84	18.1
	Total	5,152	227,817	5,500,934	715,421	113,400	6,350	34,362	32,633	3 23	10.8

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
HALTON.—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1876	Rural	3,751	224,197	5,599,342	500,655	.....	.....	25,430	23,313	3 47	8.0
	Urban	1,401	3,943	1,107,601	174,395	42,800	4,890	13,959	8,638	3 92	17.6
	Total	5,152	228,140	6,706,943	675,050	174,300	4,890	39,389	31,951	3 60	9.7
1877	Rural	3,788	227,694	5,802,195	504,652	.....	511	24,235	22,662	3 21	7.4
	Urban	1,517	3,956	1,118,790	162,055	43,050	3,200	13,571	9,213	3 74	17.8
	Total	5,305	231,650	6,920,985	666,707	182,550	3,711	37,806	31,875	3 36	9.2
1878	Rural	3,584	224,219	6,061,580	536,087	.....	.....	25,610	22,656	3 24	7.3
	Urban	1,662	3,641	1,138,836	140,925	48,900	3,222	10,563	9,765	3 15	15.9
	Total	5,246	227,860	7,200,416	677,012	185,900	3,222	36,173	32,421	3 21	8.7
1879	Rural	3,912	223,397	5,949,290	482,540	.....	5,573	28,823	22,836	3 46	8.0
	Urban	1,679	3,566	1,187,850	120,110	46,300	3,222	11,942	8,685	3 21	15.8
	Total	5,591	226,963	7,137,140	602,650	179,800	8,795	40,765	31,521	3 39	9.3
1880	Rural	4,034	223,266	6,896,410	505,886	.....	2,063	23,663	21,090	2 99	6.0
	Urban	1,584	3,704	1,215,319	110,461	44,585	3,397	10,745	10,755	3 35	16.2
	Total	5,618	226,970	8,111,729	616,347	174,685	5,460	34,408	31,845	3 10	7.6
1881	Rural	3,710	222,873	7,473,855	517,817	.....	2,943	27,696	21,531	3 34	6.2
	Urban	1,707	3,694	1,226,906	103,063	49,050	3,793	12,012	9,103	3 34	15.9
	Total	5,417	226,567	8,700,761	620,880	179,150	6,736	39,708	30,634	3 34	7.5
1882	Rural	3,703	223,948	7,454,455	549,214	.....	1,838	35,939	22,006	4 03	7.2
	Urban	1,706	3,704	1,234,396	106,212	56,890	3,726	12,532	10,617	3 75	17.3
	Total	5,409	227,652	8,688,851	655,426	179,390	5,739	48,471	32,623	3 95	8.7
1883	Rural	3,911	223,209	7,418,432	602,005	.....	4,893	37,563	21,523	4 17	7.4
	Urban	1,734	3,708	1,297,322	109,861	30,660	4,352	13,974	9,597	3 79	16.7
	Total	5,645	226,917	8,715,754	711,866	149,460	107,767	51,537	31,120	4 06	8.8
PEEL:											
1873	Rural	4,644	288,606	5,904,801	551,792	81,000	376	38,341	31,013	3 71	10.7
	Urban	895	2,190	674,557	94,163	40,000	1,065	8,967	5,141	3 91	18.3
	Total	5,539	290,796	6,579,358	645,955	238,500	1,471	47,308	36,154	3 74	11.5
1874	Rural	5,024	290,276	7,121,464	544,220	4,800	.....	36,778	29,990	3 60	8.7
	Urban	1,314	2,238	735,684	105,075	48,800	1,597	13,995	10,938	6 35	29.6
	Total	6,338	292,514	7,857,148	649,895	162,650	4,004	50,773	40,928	4 08	10.8
1875	Rural	4,674	288,040	7,298,075	571,425	45,000	.....	41,552	30,081	3 86	9.1
	Urban	1,267	2,239	785,312	106,364	47,900	2,485	10,305	7,887	4 77	20.4
	Total	5,941	290,279	8,083,387	677,789	194,500	2,485	51,857	37,968	4 02	10.2
1876	Rural	4,594	287,872	8,593,740	598,427	44,500	.....	49,144	29,863	4 17	8.6
	Urban	2,896	2,190	781,532	103,620	53,000	.....	11,705	6,340	4 63	20.4
	Total	7,490	290,062	9,375,272	702,047	192,150	.....	60,849	36,203	4 25	9.6
1877	Rural	4,936	287,956	8,577,357	603,257	44,500	.....	46,624	29,400	4 02	8.3
	Urban	1,332	2,259	837,229	118,020	38,100	375	14,388	8,072	5 41	23.5
	Total	6,268	290,215	9,414,586	721,277	164,600	375	61,012	37,472	4 27	9.7
1878	Rural	5,017	287,547	8,559,701	595,330	46,000	.....	44,562	27,621	3 78	7.9
	Urban	1,464	2,253	885,530	127,225	40,200	412	16,014	9,033	5 67	24.7
	Total	6,481	289,800	9,445,231	722,555	164,200	412	60,576	36,654	4 13	9.6
1879	Rural	5,032	288,001	8,844,910	594,575	37,000	.....	44,332	27,480	3 78	7.6
	Urban	1,515	2,246	912,940	104,575	35,400	536	14,478	8,038	5 05	22.1
	Total	6,547	290,247	9,757,850	699,150	143,900	536	58,810	35,518	4 03	9.0

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of—		Bonded Debt.	Floating Debt.	Amount of Taxes levied for—		Rate of Taxation for Municipal and School Purposes—	
				Real Property.	Personal Property.			Municipal Purposes.	School Purposes.	Per head of Population.	Mills on $.
				$	$	$	$	$	$	$ c.	Mills.
PEEL—*Continued.*											
1880	Rural	4,961	286,558	8,762,745	571,990	37,000	.....	44,112	27,374	3 84	7.7
	Urban	1,567	2,244	921,665	107,880	34,200	3,185	10,976	8,424	4 43	18.8
	Total	6,528	288,802	9,684,410	679,870	135,700	3,185	55,088	35,798	3 96	8.8
1881	Rural	5,041	287,544	8,892,960	562,315	39,820	.....	44,827	27,361	3 93	7.6
	Urban	1,545	2,216	926,011	121,050	33,200	1,388	14,942	8,350	5 57	22.2
	Total	6,586	289,760	9,818,971	683,365	133,520	1,388	59,769	35,711	4 24	9.1
1882	Rural	5,093	288,329	9,011,095	547,120	34,140	.....	45,768	27,069	4 06	7.6
	Urban	1,585	2,589	952,255	230,375	89,250	3,520	17,980	8,997	6 10	22.8
	Total	6,678	290,918	9,963,350	777,495	178,890	3,520	63,748	36,066	4 47	9.3
1883	Rural	5,133	288,349	9,007,450	552,469	37,360	.....	39,701	26,432	3 71	6.9
	Urban	1,613	2,515	880,228	255,125	70,602	11,532	17,337	10,189	6 28	24.2
	Total	6,746	290,864	9,887,678	807,594	158,462	11,532	57,038	36,621	4 22	8.7
YORK:											
1873	Rural	10,959	542,541	11,812,253	1,401,565	48,000	7,046	48,434	68,758	2 76	8.9
	Urban	1,913	5,022	1,729,165	225,573	23,321	4,866	9,511	9,793	2 64	9.9
	Total	12,872	547,563	13,541,418	1,627,138	92,321	20,971	57,945	78,551	2 74	9.0
1874	Rural	12,087	541,995	12,875,724	1,344,105	48,000	9,156	63,974	80,503	3 37	10.2
	Urban	2,028	5,022	1,906,793	252,663	26,136	5,439	12,356	12,699	3 04	11.6
	Total	14,115	547,017	14,782,427	1,596,768	140,136	26,538	76,330	93,202	3 32	10.3
1875	Rural	11,748	539,661	15,329,393	1,362,618	48,000	8,273	61,787	68,077	3 06	7.8
	Urban	2,201	4,917	2,673,572	247,134	54,767	33,606	19,533	11,669	3 56	10.7
	Total	13,949	544,578	18,002,965	1,609,752	168,767	70,204	81,320	79,746	3 14	8.2
1876	Rural	12,565	541,921	22,784,217	1,631,195	87,450	.....	70,018	64,029	2 99	5.5
	Urban	2,338	4,868	2,789,605	228,059	120,160	19,572	26,168	16,472	4 63	14.1
	Total	14,903	546,789	25,573,822	1,859,254	264,060	35,018	96,186	80,501	3 27	6.4
1877	Rural	13,000	538,816	22,929,625	1,461,170	71,850	.....	75,241	71,267	3 25	6.0
	Urban	2,635	5,364	3,254,640	253,147	128,432	28,282	27,998	13,876	4 16	11.9
	Total	15,635	544,180	26,184,265	1,714,317	238,382	42,872	103,239	85,143	3 42	6.7
1878	Rural	13,734	537,494	23,551,791	1,457,100	70,170	29,182	89,075	66,282	3 39	6.3
	Urban	2,841	5,393	3,233,211	250,307	153,208	25,252	30,367	13,095	4 31	12.5
	Total	16,575	542,887	26,785,002	1,707,407	270,028	70,724	119,442	79,377	3 55	7.1
1879	Rural	13,640	536,776	23,321,961	1,306,971	73,540	13,688	89,257	69,906	3 44	6.5
	Urban	3,202	5,961	3,805,978	214,300	202,777	22,992	36,979	17,346	4 68	13.5
	Total	16,842	542,737	27,127,939	1,521,271	341,417	43,460	126,236	87,252	3 69	7.4
1880	Rural	14,077	537,675	23,153,205	1,013,770	40,090	19,171	76,191	65,757	3 12	5.9
	Urban	3,309	5,902	4,014,178	216,115	210,249	34,939	29,982	18,063	4 01	11.4
	Total	17,386	543,577	27,167,383	1,229,885	311,412	61,308	106,173	83,820	3 31	6.7
1881	Rural	13,531	540,719	23,125,704	1,227,125	41,586	17,280	77,550	65,296	3 08	5.9
	Urban	3,838	6,385	4,553,942	260,834	275,904	28,648	40,345	18,497	4 45	12.2
	Total	17,369	547,104	27,679,646	1,487,959	374,293	45,928	117,895	83,793	3 38	6.9
1882	Rural	13,507	537,411	23,536,564	1,205,640	82,636	15,162	71,253	68,303	3 11	5.6
	Urban	4,723	6,837	5,544,161	279,855	352,750	41,338	47,296	24,807	4 59	12.4
	Total	18,230	544,248	29,080,725	1,485,495	468,236	64,578	118,549	93,110	3 49	6.9
1883	Rural	13,223	538,758	23,856,668	1,237,790	43,829	14,610	76,269	64,638	3 14	5.6
	Urban	3,671	6,705	3,478,869	133,535	203,508	23,171	22,998	22,617	4 06	12.6
	Total	16,894	545,463	27,335,537	1,371,325	280,187	37,781	99,267	87,255	3 32	6.5

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
ONTARIO:				$	$	$	$	$	$	$ c.	Mills.
1873	Rural	7,834	487,290	7,217,770	880,034	69,250	.....	61,685	47,727	3 22	13.5
	Urban	2,257	7,250	1,489,377	200,460	56,200	13,520	27,033	20,232	5 09	28.0
	Total	10,091	494,540	8,707,147	1,080,494	145,450	13,520	88,718	67,959	3 63	16.0
1874	Rural	7,834	490,246	7,972,440	890,384	74,300	400	52,572	51,427	3 12	11.7
	Urban	2,243	7,250	1,489,377	187,810	81,500	14,800	30,013	15,671	4 92	27.2
	Total	10,077	497,496	9,461,817	1,078,194	175,800	15,200	82,585	67,098	3 52	14.2
1875	Rural	8,751	487,636	15,119,245	1,166,775	55,600	1,882	58,943	48,000	3 19	6.6
	Urban	2,466	7,135	2,211,965	313,977	121,025	30,913	41,767	14,403	5 29	22.2
	Total	11,217	494,771	17,331,210	1,480,752	196,625	32,795	100,710	62,403	3 73	8.7
1876	Rural	8,752	489,806	15,167,381	1,150,275	81,600	2,282	57,766	52,101	3 27	6.7
	Urban	2,466	7,135	2,211,965	313,977	121,025	30,913	41,767	17,193	5 58	23.3
	Total	11,218	496,941	17,379,346	1,464,252	222,625	33,195	99,533	69,294	3 82	9.0
1877	Rural	9,302	477,836	15,731,785	1,004,867	93,303	2,630	57,645	53,565	3 28	6.6
	Urban	2,551	7,065	2,292,389	279,983	174,925	34,541	34,392	21,538	5 05	21.7
	Total	11,853	484,901	18,024,174	1,284,850	288,228	37,171	92,037	75,103	3 72	8.7
1878	Rural	9,473	478,371	15,911,987	920,513	95,382	8,166	68,957	48,839	3 50	7.0
	Urban	2,974	7,107	2,952,036	773,635	170,525	33,345	45,635	24,271	5 58	18.8
	Total	12,447	485,478	18,864,023	1,694,148	285,907	41,511	114,592	73,110	4 06	9.1
1879	Rural	9,393	476,937	15,618,908	821,315	130,816	6,458	63,684	47,547	3 32	6.8
	Urban	2,973	7,594	3,101,906	226,358	210,525	18,172	39,681	24,365	5 23	19.2
	Total	12,366	484,531	18,720,814	1,047,673	361,341	24,630	103,365	71,912	3 83	8.9
1880	Rural	9,335	478,662	15,469,385	845,866	127,479	3,210	57,074	48,028	3 12	6.4
	Urban	2,952	7,608	2,924,699	204,940	196,400	20,067	38,443	21,966	5 04	19.3
	Total	12,287	486,270	18,394,084	1,050,806	333,879	23,277	95,517	69,994	3 63	8.5
1881	Rural	9,309	500,911	15,301,307	863,348	91,728	1,282	55,684	48,720	3 09	6.5
	Urban	2,853	7,664	2,861,423	200,858	182,325	19,618	38,300	22,014	5 29	19.7
	Total	12,162	508,575	18,162,730	1,064,206	294,053	20,900	93,984	70,734	3 65	8.6
1882	Rural	9,345	494,444	15,271,105	951,285	87,330	29,988	58,221	50,815	3 25	6.7
	Urban	2,988	7,638	2,881,630	220,431	178,475	21,626	39,415	22,542	5 33	20.0
	Total	12,333	502,082	18,152,735	1,171,716	285,805	51,614	97,636	73,357	3 78	8.8
1883	Rural	9,389	497,056	15,345,866	966,710	120,863	3,099	58,171	50,269	3 29	6.6
	Urban	2,971	7,746	2,861,568	205,400	174,475	22,581	39,736	24,623	5 52	21.0
	Total	12,360	504,802	18,207,434	1,172,110	315,338	25,680	97,907	74,892	3 87	8.9
DURHAM AND NORTHUMBERLAND:											
1873	Rural	12,049	797,193	8,904,725	949,709	34,949	6,758	53,328	83,864	2 64	13.9
	Urban	4,483	12,205	3,582,631	791,489	278,930	7,031	51,396	20,451	4 42	16.4
	Total	16,532	809,398	12,487,356	1,741,198	537,544	13,789	104,724	104,315	3 06	14.7
1874	Rural	12,193	803,419	10,777,843	970,342	159,763	6,057	72,205	85,950	3 08	13.5
	Urban	4,913	14,196	3,891,564	932,955	245,516	7,207	55,982	30,157	4 82	17.8
	Total	17,106	817,615	14,669,407	1,903,297	596,744	13,264	128,187	116,107	3 53	14.7
1875	Rural	11,982	807,326	18,875,821	1,457,342	156,271	5,677	84,340	81,953	3 29	8.2
	Urban	5,675	14,228	4,092,806	857,462	575,962	14,753	60,819	34,552	5 22	19.3
	Total	17,657	821,554	22,968,627	2,314,804	882,643	20,430	145,159	116,505	3 80	10.3
1876	Rural	11,977	802,724	21,961,054	1,361,914	162,413	2,989	89,203	79,205	3 34	7.2
	Urban	4,750	13,202	4,785,320	972,294	576,437	28,862	57,767	29,170	4 43	15.1
	Total	16,727	815,926	26,746,374	2,334,208	847,650	31,851	146,970	108,375	3 65	8.8

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of—		Bonded Debt.	Floating Debt.	Amount of Taxes levied for—		Rate of Taxation for Municipal and School Purposes—	
				Real Property.	Personal Property.			Municipal Purposes.	School Purposes.	Per head of Population.	Mills on $.
				$	$	$	$	$	$	$ c.	Mills.
DURHAM AND NORTHUMBERLAND.—*Continued.*											
1877	Rural	12,727	800,859	21,873,279	1,302,471	137,738	.....	76,481	81,669	3 11	6.8
	Urban	4,910	12,377	4,767,498	890,524	541,709	26,652	65,664	29,580	4 73	16.8
	Total	17,637	813,236	26,640,777	2,192,995	795,597	26,652	142,145	111,249	3 57	8.8
1878	Rural	13,045	800,792	21,763,325	1,238,915	113,665	10,451	86,808	78,085	3 31	7.2
	Urban	5,013	12,784	4,854,719	809,700	507,795	24,443	70,616	28,211	5 11	17.4
	Total	18,058	813,576	26,618,044	2,048,615	744,960	34,894	157,424	106,296	3 81	9.2
1879	Rural	13,066	801,828	21,734,778	1,196,255	78,206	8,538	89,152	75,551	3 34	7.2
	Urban	5,271	12,730	4,632,408	655,653	501,311	13,125	65,022	28,061	4 77	17.6
	Total	18,337	814,558	26,367,186	1,851,908	670,517	21,663	154,174	103,612	3 75	9.1
1880	Rural	12,640	801,253	21,165,876	1,184,317	90,657	3,642	88,050	73,506	3 27	7.2
	Urban	5,300	13,124	4,772,939	680,516	476,141	21,709	65,456	34,714	4 89	18.4
	Total	17,940	814,377	25,938,815	1,864,833	624,763	25,351	153,506	108,220	3 74	9.4
1881	Rural	13,266	807,377	21,768,527	1,200,235	80,303	7,366	83,881	74,617	3 11	6.9
	Urban	5,405	13,581	4,778,660	689,804	536,825	9,413	69,039	31,932	4 87	18.5
	Total	18,671	820,958	26,547,187	1,890,039	642,058	16,779	152,920	106,549	3 62	9.1
1882	Rural	13,327	796,788	21,587,392	1,271,670	31,957	9,071	74,214	75,080	2 97	6.5
	Urban	5,562	13,775	5,155,223	713,758	519,248	7,180	73,463	31,083	4 96	17.8
	Total	18,889	810,563	26,742,615	1,985,428	551,205	16,251	147,677	106,163	3 56	8.8
1883	Rural	13,091	800,485	21,675,095	1,235,255	35,826	7,162	71,385	77,844	3 12	6.5
	Urban	5,561	13,956	4,945,349	716,922	497,340	9,855	68,211	37,235	4 96	18.6
	Total	18,652	814,441	26,620,444	1,952,177	533,166	17,017	139,596	115,079	3 69	8.9
PRINCE EDWARD:											
1873	Rural	3,900	234,375	4,260,150	449,851	.....	.....	14,472	24,692	2 71	8.3
	Urban	670	2,083	562,645	104,950	7,700	.....	5,560	4,652	3 85	15.3
	Total	4,570	236,458	4,822,795	554,801	7,700	.....	20,032	29,344	2 89	9.2
1874	Rural	4,151	232,016	4,113,909	369,538	.....	.....	13,764	25,233	2 76	8.7
	Urban	763	2,050	624,140	106,000	7,350	.....	6,378	3,922	3 51	14.1
	Total	4,914	234,066	4,738,049	475,538	7,350	.....	20,142	29,155	2 89	9.5
1875	Rural	4,242	229,428	5,715,598	464,606	.....	.....	15,176	27,029	2 84	6.8
	Urban	747	2,057	834,580	118,850	6,400	2,400	7,729	3,285	3 76	11.5
	Total	4,989	231,485	6,550,178	583,456	6,400	2,400	22,905	30,314	2 99	7.5
1876	Rural	4,269	228,504	5,749,383	426,040	.....	.....	15,303	24,961	2 67	6.5
	Urban	737	2,299	857,315	102,500	5,650	1,900	8,358	4,675	4 16	13.6
	Total	5,006	230,803	6,606.698	528,540	5,650	1,900	23,661	29,636	2 93	7.5
1877	Rural	4,410	229,241	6,227,535	391,978	.....	.....	18,738	26,531	3 90	6.8
	Urban	816	2,013	935,135	97,100	5,250	1,300	7,344	6,067	4 01	13.0
	Total	5,226	231,254	7,162,670	489,078	5,250	1,300	26,082	32,598	3 10	7.7
1878	Rural	4,498	230,938	5,813,541	372,976	.....	.....	18,901	26,245	2 96	7.3
	Urban	885	2,011	969,815	87,300	4,900	1,250	10,547	10,850	6 38	20.2
	Total	5,383	232,949	6,783,356	460,276	4,900	1,250	29,448	37,095	3 58	9.2
1879	Rural	4,575	231,680	5,668,581	374,340	.....	.....	18,961	23,639	2 75	7.0
	Urban	969	2,011	1,036,610	65,870	24,200	3,604	9,321	6,269	4 59	14.1
	Total	5,544	233,691	6,705,191	440,210	84,200	5,604	28,282	29,908	3 08	8.1
1880	Rural	4,763	229,180	5,659,721	437,904	675	.....	19,383	24,854	2 88	7.2
	Urban	1,414	2,020	1,056,245	54,450	25,425	3,000	9,482	6,941	4 86	14.8
	Total	6,177	231,200	6,715,966	492,354	86,100	3,000	28,865	31,795	3 23	8.4

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of—		Bonded Debt.	Floating Debt.	Amount of Taxes levied for—		Rate of Taxation for Municipal and School Purposes—	
				Real Property.	Personal Property.			Municipal Purposes.	School Purposes.	Per head of Population.	Mills on $
				$	$	$	$	$	$	$ c.	Mills.
PRINCE EDWARD.—*Con.*											
1881	Rural	4,772	230,207	5,639,519	336,820	675	.....	20,161	25,249	3 00	7.6
	Urban	892	2,014	1,058,755	59,350	25,186	.....	7,395	7,759	4 05	13.5
	Total	5,664	232,221	6,698,274	396,170	83,861	3,000	27,556	33,008	3 27	8.5
1882	Rural	4,815	229,504	5,789,445	345,273	675	.....	20,177	24,372	3 02	7.3
	Urban	1,010	2,014	1,073,870	60,150	23,915	5,827	7,826	8,616	4 81	14.5
	Total	5,825	231,518	6,863,315	405,423	81,590	5,827	28,003	32,988	3 36	8.4
1883	Rural	4,757	230,746	5,768,061	353,592	.....	.....	21,931	25,206	3 10	7.7
	Urban	891	2,012	1,089,525	79,250	22,647	7,027	8,308	7,395	4 85	13.4
	Total	5,648	232,758	6,857,586	432,842	79,647	7,027	30,239	32,601	3 41	8.6
LENNOX AND ADDINGTON:											
1873	Rural	5,025	358,590	3,213,035	308,374	2,200	.....	22,095	27,941	2 79	14.2
	Urban	1,232	6,424	791,024	80,350	30,132	5,300	8,843	7,537	3 85	18.8
	Total	6,257	365,014	4,004,059	388,724	158,332	54,496	30,938	35,478	2 99	15.1
1874	Rural	5,131	370,534	3,189,162	254,386	2,000	2,305	24,412	27,801	2 98	15.2
	Urban	1,264	6,424	1,005,861	65,450	30,132	2,800	8,447	8,020	3 58	15.4
	Total	6,395	376,958	4,195,023	319,836	162,132	23,356	32,859	35,821	3 10	15.2
1875	Rural	5,181	372,781	3,867,356	280,017	.....	.....	25,626	25,617	2 89	12.4
	Urban	1,360	6,430	1,046,231	60,725	27,288	5,535	8,551	7,935	3 47	14.9
	Total	6,541	379,211	4,913,587	340,742	187,288	40,035	34,177	33,552	3 01	12.9
1876	Rural	5,238	367,040	4,906,294	292,214	.....	.....	27,370	25,958	2 90	10.3
	Urban	1,368	6,581	1,112,688	45,150	34,780	.....	13,852	8,053	4 70	18.9
	Total	6,606	373,621	6,018,982	337,364	194,780	37,000	41,222	34,011	3 26	11.8
1877	Rural	5,375	400,636	5,811,783	297,462	100	.....	33,355	23,290	3 19	9.3
	Urban	1,198	6,800	1,075,092	41,300	34,788	.....	15,319	8,769	5 58	21.6
	Total	6,573	307,436	6,886,875	338,762	194,888	.....	48,674	32,059	3 58	11.2
1878	Rural	5,692	395,515	6,119,415	301,187	.....	.....	33,089	23,047	3 02	8.7
	Urban	1,322	6,581	962,480	35,650	30,900	400	10,027	7,047	4 13	17.1
	Total	7,014	402,096	7,081,895	336,787	190,900	400	43,116	30,094	3 22	9.9
1879	Rural	5,722	404,754	6,270,496	361,180	1,446	4,878	34,039	26,394	3 20	9.1
	Urban	1,375	6,581	950,933	43,275	34,400	148	15,250	10,481	5 91	25.9
	Total	7,098	411,335	7,221,429	404,455	195,846	12,626	49,289	36,875	3 70	11.3
1880	Rural	5,820	399,328	6,374,449	271,793	.....	811	32,821	24,674	3 17	8.6
	Urban	1,321	6,710	959,363	38,300	39,500	.....	13,885	8,160	4 83	22.1
	Total	7,141	406,038	7,333,812	310,093	199,500	8,411	46,706	32,834	3 51	10.4
1881	Rural	5,787	394,114	6,403,149	307,445	45,000	3,094	39,913	23,980	3 51	9.5
	Urban	1,426	6,870	1,018,848	64,550	56,900	.....	14,013	7,751	4 67	20.1
	Total	7,213	400,984	7,421,997	371,995	261,900	11,694	53,926	31,731	3 75	11.0
1882	Rural	5,592	395,239	6,413,826	276,654	34,708	5,274	43,699	25,223	3 77	10.3
	Urban	1,385	6,380	1,079,054	94,450	58,000	.....	17,626	12,091	6 25	25.3
	Total	6,977	401,619	7,492,880	371,104	252,708	15,082	61,325	37,314	4 28	12.5
1883	Rural	5,692	392,858	6,433,124	303,096	45,000	1,389	44,207	26,827	3 91	10.5
	Urban	1,431	6,503	1,072,834	100,150	68,000	.....	23,658	8,971	6 57	27.8
	Total	7,123	399,361	7,505,958	403,246	273,000	9,408	67,865	35,798	4 52	13.1
FRONTENAC:											
1873	Rural	4,861	528,934	2,403,128	355,173	1,100	220	33,527	36,682	3 39	25.5
	Urban	397	568	149,820	53,300	400	.....	1,668	2,033	2 24	18.2
	Total	5,258	529,502	2,552,948	408,473	128,159	618	35,195	38,715	3 31	25.0

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes Levied for— Municipal Purposes.	Amount of Taxes Levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
FRONTENAC.—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1874	Rural	5,119	544,611	2,429,145	351,383	785	2,060	31,226	27,632	2 83	21.1
	Urban	394	568	148,660	55,500	.....	.....	1,612	1,512	1 92	15.3
	Total	5,513	545,179	2,577,805	406,883	138,185	2,060	32,838	29,144	2 76	20.8
1875	Rural	5,098	552,707	2,450,262	319,850	825	2,174	32,958	28,377	2 99	22.1
	Urban	374	568	144,850	82,550	.....	.....	2,359	1,459	2 39	16.8
	Total	5,472	553,275	2,595,112	402,400	138,225	2,174	35,317	29,836	2 94	21.7
1876	Rural	5,243	560,598	3,303,057	341,539	.....	192	39,995	30,867	3 36	16.7
	Urban	364	568	144,725	110,600	200	1,001	2,678	1,586	2 71	16.7
	Total	5,607	561,166	3,447,782	452,139	248,700	1,193	42,673	32,453	3 31	16.7
1877	Rural	5,387	576,507	3,806,512	382,299	.....	2,144	46,824	30,450	3 71	18.4
	Urban	344	568	147,350	42,300	200	1,405	2,553	2,808	3 48	28.0
	Total	5,731	577,075	3,953,862	424,599	262,600	3,549	49,377	33,258	3 69	18.9
1878	Rural	5,669	603,007	4,343,155	338,426	.....	2,490	46,787	28,508	3 50	16.1
	Urban	366	564	143,600	44,600	200	1,639	1,785	2,344	3 05	21.2
	Total	6,035	603,571	4,486,755	383,026	262,200	6,989	48,572	30,852	3 48	16.3
1879	Rural	5,899	607,396	4,627,176	352,814	.....	534	48.057	29,531	3 53	15.6
	Urban	333	564	133,830	40,450	.....	983	1,743	2,124	2 69	22.2
	Total	6,232	607,960	4,761,006	393,264	256,500	1,517	49,800	31,655	3 48	15.8
1880	Rural	5,894	608,228	4,494,821	355,615	.....	6,453	43,441	30,782	3 46	15.3
	Urban	352	564	134,868	42,200	.....	1,933	1,771	2,128	2 70	22.0
	Total	6,246	608,792	4,629,689	397,815	255,230	8,386	45,212	32,910	3 41	15.5
1881	Rural	5,871	609,438	4,637,178	358,604	.....	4,054	42,295	29,646	3 41	14.4
	Urban	352	564	135,321	36,200	.....	2,247	1,536	2,038	2 38	20.8
	Total	6,223	610,002	4,772,499	394,804	251,000	6,301	43,831	31,684	3 34	14.6
1882	Rural	5,897	604,582	4,500,907	356,721	.....	4,969	38,625	31,716	3 38	14.5
	Urban	349	564	128,780	36,000	400	1,292	2,680	2,099	3 06	29.0
	Total	6,246	605,146	4,629,687	392,721	247,900	9,987	41,305	33,815	3 36	15.0
1883	Rural	5,723	640,099	4,528,712	389,580	400	8,973	38,074	30,709	3 29	14.0
	Urban	334	575	128,560	47,100	400	1,137	2,851	2,085	3 15	28.1
	Total	6,057	640,674	4,657,272	436,680	244,800	11,010	40,925	32,794	3 28	14.5
LEEDS AND GRENVILLE:											
1873	Rural	9,768	750,242	5,703,470	541,988	.....	.....	44,710	48,620	2 42	14.9
	Urban	4,306	3,530	2,279,917	277,750	44,400	.....	22,299	14,634	2 98	14.4
	Total	14,074	753,772	7,983,387	819,738	64,400	19,580	67,009	63,254	2 56	14.8
1874	Rural	10,480	732,801	5,709,919	529,500	2,700	.....	41,159	59,332	2 59	16.1
	Urban	4,433	3,533	2,925,233	348,493	80,150	13,419	33,345	14,447	3 65	14.6
	Total	14,913	736,334	8,635,152	877,993	102,850	29,503	74,504	73,779	2 86	15.6
1875	Rural	10,472	723,841	10,728,419	754,331	6,200	91	47,642	60,662	2 70	9.4
	Urban	4,737	3,421	3,333,319	463,640	72,100	14,238	43,685	16,749	3 88	15.9
	Total	15,209	727,262	14,061,738	1,217,971	98,300	32,311	91,327	77,411	3 14	11.0
1876	Rural	10,469	732,568	9,661,153	866,871	6,195	639	43,230	58,487	2 58	9.7
	Urban	4,861	5,127	3,758,635	373,320	105,600	.....	38,787	19,521	4 00	14.1
	Total	15,330	737,695	13,419,788	1,240,191	151,795	7,020	82,017	78,008	2 96	10.9
1877	Rural	11,133	733,150	10,246,880	824,732	5,750	.....	48,135	56,263	2 61	9.4
	Urban	4,743	5,310	3,683,978	318,375	112,004	2,590	38,682	18,097	3 91	14.2
	Total	15,876	738,460	13,930,858	1,143,107	157,754	16,539	86,817	74,360	2 96	10.7

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes Levied for— Municipal Purposes.	Amount of Taxes Levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $
LEEDS AND GRENVILLE.—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1878	Rural	11,465	735,192	10,025,525	839,499	5,969	....	44,901	52,775	2 42	9.0
	Urban	4,895	5,003	3,674,008	261,350	117,608	2,060	39,653	20,341	4 14	15.2
	Total	16,360	740,195	13,699,533	1,100,849	143,577	14,060	84,554	73,116	2 88	10.7
1879	Rural	11,524	740,013	10,038,147	725,870	5,128	1,742	41,667	52,725	2 37	8.8
	Urban	4,979	4,786	3,689,745	276,250	112,400	30	43,365	21,346	4 16	16.3
	Total	16,503	744,799	13,727,892	1,002,120	137,528	16,772	85,032	74,071	2 87	10.8
1880	Rural	11,280	747,929	9,853,711	711,039	3,098	1,031	44,169	54,448	2 54	9.3
	Urban	3,784	5,160	3,785,225	267,040	108,000	.....	39,143	21,084	3 68	14.9
	Total	15,064	753,089	13,638,936	978,079	146,098	1,031	83,312	75,532	2 88	10.9
1881	Rural	11,216	749,955	9,846,276	712,041	3,204	379	39,097	51,766	2 39	8.6
	Urban	3,960	5,327	3,759,165	259,900	104,700	.....	43,200	22,731	4 17	16.4
	Total	15,176	755,282	13,605,441	971,941	142,904	379	82,297	74,497	2 92	10.8
1882	Rural	10,918	748,790	9,527,398	749,610	8,939	341	43,786	52,919	2 54	9.4
	Urban	4,046	5,482	3,781,861	273,700	108,200	.....	42,261	22,879	4 06	16.1
	Total	14,964	754,272	13,309,259	1,023,310	152,139	341	86,047	75,798	2 99	11.3
1883	Rural	11,182	741,350	9,843,689	769,587	8,411	.....	47,426	53,996	2 69	9.6
	Urban	4,002	5,246	3,758,580	254,050	122,300	12,000	44,914	22,394	4 10	16.8
	Total	15,184	746,596	13,602,269	1,023,637	165,711	12,000	92,340	76,390	3 12	11.5
DUNDAS, STORMONT AND GLENGARRY:											
1873	Rural	9,730	742,540	5,708,354	706,669	2,800	792	42,665	56,382	2 22	15.4
	Urban	1,592	2,647	773,947	235,900	2,000	.....	8,330	3,881	2 55	12.1
	Total	11,322	745,187	6,482,301	942,569	4,800	792	50,995	60,263	2 25	15.0
1874	Rural	10,201	742,503	5,765,399	692,536	47,635	2,895	41,761	58,165	2 24	15.5
	Urban	1,434	2,590	1,058,125	235,148	24,973	1,000	16,642	5,723	4 24	17.3
	Total	11,635	745,093	6,823,524	927,684	72,608	3,895	58,403	63,888	2 44	15.8
1875	Rural	10,058	748,744	5,953,528	805,072	57,000	2,859	40,077	56,904	2 16	14.4
	Urban	1,433	2,489	903,202	181,446	31,333	900	12,788	11,784	4 30	22.6
	Total	11,491	751,233	6,856,730	986,518	88,333	3,759	52,865	68,688	2 40	15.5
1876	Rural	10,275	772,062	7,526,998	929,813	24,500	.....	39,582	54,567	2 03	11.1
	Urban	1,254	2,623	1,216,475	182,650	26,867	607	15,776	7,741	4 39	16.8
	Total	11,529	774,685	8,743,473	1,112,463	51,367	2,041	55,358	62,308	2 27	11.9
1877	Rural	10,835	782,167	8,227,441	779,857	54,500	2,635	47,220	55,726	2 14	11.4
	Urban	1,444	2,623	1,244,220	175,725	25,602	3,700	13,550	14,154	4 68	19.8
	Total	12,279	784,790	9,471,661	955,582	80,102	6,335	60,770	69,880	2 42	12.6
1878	Rural	11,077	770,512	12,431,684	1,005,506	41,500	.....	45,811	56,774	2 14	7.6
	Urban	1,489	2,623	1,370,185	166,650	26,333	5,100	12,248	6,156	3 00	12.9
	Total	12,566	773,135	13,801,869	1,172,156	67,833	5,100	58,059	62,930	2 23	8.1
1879	Rural	11,097	767,387	12,233,459	953,376	22,627	5,186	50,914	56,138	2 21	8.1
	Urban	1,539	2,623	1,418,875	163,900	29,467	.....	13,937	9,956	3 63	15.1
	Total	12,636	770,010	13,652,334	1,117,276	52,094	5,186	64,851	66,094	2 38	8.9
1880	Rural	11,260	763,738	12,087,673	865,350	14,500	.....	47,958	57,865	2 21	8.2
	Urban	1,626	2,623	1,409,800	165,450	41,349	290	13,054	12,915	3 81	16.5
	Total	12,886	766,361	13,497,473	1,030,800	55,849	290	61,012	70,780	2 41	9.1

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
DUNDAS, STORMONT AND GLENGARRY—*Continued.*				$	$	$	$	$	$	$ c.	Mills.
1881	Rural	11,626	766,467	12,331,821	899,019	48,000	2,820	49,641	56,047	2 17	8.0
	Urban	1,626	2,623	1,511,791	188,490	31,885	590	12,589	10,014	3 34	13.3
	Total	13,252	769,090	13,843,612	1,087,509	79,885	3,410	62,230	66,061	2 31	8.6
1882	Rural	11,692	769,765	12,252,946	976,375	42,000	4,814	51,963	57,439	2 26	8.3
	Urban	1,753	2,653	1,666,770	181,250	33,171	436	10,951	10,774	3 11	11.7
	Total	13,445	772,418	13,919,716	1,157,625	75,171	5,250	62,914	68,213	2 37	8.7
1883	Rural	11,911	778,223	12,261,703	910,581	42,000	9,869	51,572	61,539	2 27	8.8
	Urban	1,880	2,570	1,646,325	177,350	64,936	13,411	12,808	12,108	3 29	13.7
	Total	13,791	780,793	13,908,028	1,087,931	106,936	23,280	64,380	73,647	2 41	9.2
PRESCOTT AND RUSSELL:											
1873	Rural	4,935	501,200	1,922,032	264,441	.....	503	16,840	23,756	1 74	18.6
	Urban	237	5,395	163,050	72,270	4,000	.....	1,849	987	2 26	12.0
	Total	5,172	506,595	2,085,082	336,711	4,000	2,503	18,689	24,743	1 77	17.9
1874	Rural	5,221	508,133	2,047,636	202,870	.....	62	19,459	24,648	1 91	19.6
	Urban	255	5,228	160,600	69,980	1,750	.....	2,306	1,678	3 06	17.3
	Total	5,476	513,361	2,208,236	272,850	17,750	62	21,765	26,326	1 97	19.4
1875	Rural	5,390	515,066	2,191,768	206,192	.....	.....	22,151	21,889	1 87	18.7
	Urban	267	5,061	187,520	68,125	1,000	15	1,713	1,906	2 69	14.2
	Total	5,657	520,127	2,379,288	274,317	16,000	15	23,864	23,795	1 92	18.3
1876	Rural	5,485	538,980	2,433,698	248,461	4,023	.....	24,301	23,320	1 88	17.7
	Urban	429	9,157	258,850	79,430	750	.....	2,368	2,971	2 79	15.8
	Total	5,914	548,137	2,692,548	327,891	18,773	.....	26,669	26,291	1 94	17.5
1877	Rural	5,622	533,314	2,614,552	244,369	197	1,442	24,260	25,770	2 02	17.5
	Urban	434	9,157	261,180	78,825	10,950	.....	2,821	3,053	2 57	17.3
	Total	6,056	542,471	2,875,732	323,194	24,147	1,442	27,081	28,823	2 06	17.5
1878	Rural	5,777	535,999	3,079,091	257,531	2,000	2,242	23,053	23,881	1 76	14.1
	Urban	436	9,383	277,415	82,320	10,450	837	2,206	3,898	2 82	17.0
	Total	6,213	545,382	3,356,506	339,851	23,450	3,079	25,259	27,779	1 84	14.3
1879	Rural	6,002	538,349	3,005,336	243,879	830	2,583	23,668	24,609	1 88	14 9
	Urban	444	9,016	267,883	75,745	9,950	.....	2,151	2,596	2 14	13.8
	Total	6,446	547,365	3,273,219	319,624	20,780	2,583	25,819	27,205	1 90	14.8
1880	Rural	5,967	534,727	3,952,982	229,222	500	2,474	22,944	26,201	1 84	15.4
	Urban	446	9,111	281,337	74,540	3,950	600	3,559	3,863	3 39	20.8
	Total	6,413	543,838	3,234,319	303,762	14,450	3,074	26,503	30,064	1 95	16.0
1881	Rural	6,024	536,746	4,138,952	259,440	400	6,407	23,693	28,259	1 91	11.8
	Urban	444	9,418	288,945	76,925	4,050	.....	3,767	3,162	3 12	18.9
	Total	6,468	546,164	4,427,897	336,365	14,430	6,407	27,460	31,421	2 00	12.4
1882	Rural	6,147	529,263	3,821,787	290,780	1,500	8,494	22,971	28,310	1 85	12.5
	Urban	444	9,419	288,945	76,925	4,050	.....	3,767	3,319	3 30	19.4
	Total	6,591	538,682	4,110,732	367,705	13,550	8,494	26,738	31,629	1 95	13.0
1883	Rural	6,540	536,985	4,148,610	288,590	2,071	10,358	27,199	33,046	2 01	13.8
	Urban	640	9,419	291,995	75,650	8,000	90	2,574	3,509	2 69	16.5
	Total	7,180	546,404	4,440,605	364,240	17,071	14,739	29,773	36,555	2 06	13.8

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $
				$	$	$	$	$	$	$ c.	Mills.
CARLETON:											
1873	Rural	6,152	557,021	3,564,352	451,409	.....	.....	37,626	34,743	3 00	18.0
	Urban	247	1,519	261,325	33,505	3,800	.....	2,667	2,450	4 70	17.4
	Total	6,399	558,540	3,825,677	484,914	63,800	.....	40,293	37,193	3 07	18.0
1874	Rural	6,326	553,621	3,591,191	453,302	.....	5,510	31,220	39,001	2 66	17.4
	Urban	310	1,512	279,028	28,880	3,400	.....	3,020	1,939	4 32	16.1
	Total	6,636	555,133	3,870,219	482,182	83,400	5,510	34,240	40,940	2 73	17.3
1875	Rural	6,778	550,025	3,860,328	422,779	400	6,441	37,307	39,446	2 86	17.9
	Urban	327	1,467	313,903	31,920	7,900	.....	3,024	2,187	4 50	15.1
	Total	7,105	551,492	4,174,231	454,699	88,300	6,441	40,331	41,633	2 93	17.7
1876	Rural	7,180	554,692	4,673,005	436,932	400	6,528	41,606	40,297	2 94	16.0
	Urban	315	1,509	319,338	26,500	9,500	.....	3,713	2,042	4 38	16.6
	Total	7,495	556,201	4,992,343	463,432	89,900	11,072	45,319	42,339	3 01	16.1
1877	Rural	7,460	558,719	7,141,802	431,714	7,200	8,694	43,205	39,540	2 82	10.9
	Urban	341	1,509	331,561	19,650	9,300	.....	3,954	2,841	4 90	19.3
	Total	7,801	560,228	7,473,363	451,364	96,500	37,840	47,159	42,381	2 91	11.3
1878	Rural	7,500	559,433	7,058,654	428,505	7,000	22,946	41,683	36,841	2 61	10.5
	Urban	366	1,547	333,831	17,500	8,400	.....	4,070	1,793	4 37	16.7
	Total	7,866	560,980	7,392,485	446,005	95,400	70,698	45,753	38,634	2 68	10.8
1879	Rural	7,457	554,786	6,780,418	477,185	6,800	25,049	40,266	38,367	2 56	10.8
	Urban	379	1,580	334,040	16,600	7,400	.....	4,032	1,858	4 63	16.8
	Total	7,836	556,366	7,114,458	493,785	109,200	26,644	44,298	40,225	2 64	11.1
1880	Rural	7,606	560,417	6,810,721	416,465	6,400	18,868	42,424	39,300	2 73	11.3
	Urban	358	1,497	344,765	24,974	6,700	.....	3,752	2,654	5 08	17.3
	Total	7,964	561,914	7,155,486	441,439	108,100	18,868	46,176	41,954	2 83	11.6
1881	Rural	7,674	559,289	6,769,801	482,085	6,254	15,825	36,855	40,316	2 49	10.6
	Urban	356	1,505	353,600	42,550	5,500	.....	4,629	2,108	5 40	17 0
	Total	8,030	560,794	7,123,401	524,635	86,754	53,658	41,484	42,424	2 61	11.0
1882	Rural	7,548	552,287	6,723,461	478,078	6,200	14,092	35,884	39,929	2 53	10.5
	Urban	361	1,505	355,345	41,902	4,400	.....	5,199	2,055	5 79	18.3
	Total	7,909	553,792	7,078,806	519,980	65,600	14,092	41,083	41,984	2 66	10.9
1883	Rural	7,444	558,460	7,224,547	477,082	6,000	14,983	38,658	30,541	2 75	10.1
	Urban	372	1,544	350,105	42,476	8,998	.....	4,738	2,003	4 51	17.2
	Total	7,816	560,004	7,574,652	519,558	69,998	14,983	43,396	41,544	2 84	10.5
RENFREW:											
1873	Rural	4,652	616,017	1,066,782	276,230	6,500	990	22,341	24,487	2 16	34.9
	Urban	1,185	3,859	539,325	94,315	30,000	8,800	14,215	7,043	3 74	33.5
	Total	5,837	619,876	1,606,107	370,545	36,500	9,790	36,556	31,530	2 48	34.4
1874	Rural	4,874	619,661	1,155,481	308,871	6,248	7,420	23,065	25,166	2 21	32.9
	Urban	1,247	3,865	707,479	91,595	32,600	4,600	18,806	7,736	4 57	33.2
	Total	6,121	623,526	1,862,960	400,466	65,598	12,020	41,871	32,902	2 71	33.0
1875	Rural	4,911	651,904	1,904,426	327,825	8,834	.....	27,463	30,341	2 41	25.9
	Urban	1,293	3,923	1,311,175	198,695	58,548	11,253	17,756	18,513	6 33	24.0
	Total	6,204	655,827	3,215,601	526,520	94,132	11,253	45,219	48,854	3 16	25.1
1876	Rural	5,110	663,504	1,897,466	323,986	5,839	.....	24,636	25,554	2 19	22.6
	Urban	1,214	3,852	1,506,230	201,195	115,991	14,401	19,620	10,687	5 75	17.8
	Total	6,324	667,356	3,403,696	525,181	147,830	14,401	44,256	36,241	2 76	20

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
RENFREW.—*Continued.*				$	$	$	$	$	$	$ c.	Mills
1877	Rural	5,503	679,020	1,858,741	322,498	11,511	1,600	23,920	28,204	2 04	23.9
	Urban	1,272	3,893	1,380,612	193,265	115,982	3,500	17,553	16,692	5 91	21.8
	Total	6,775	682,913	3,239,353	515,763	152,743	5,100	41,473	44,896	2 73	23.0
1878	Rural	5,567	706,701	2,024,170	335,916	15,641	1,558	25,284	28,181	2 07	22.6
	Urban	1,544	3,823	1,297,570	176,115	127,318	10,687	14,096	12,808	4 64	18.3
	Total	7,111	710,524	3,321,740	512,031	167,459	12,245	39,380	40,989	2 54	21.0
1879	Rural	5,889	770,882	2,004,768	276,045	10,185	.....	24,164	25,539	1 89	21.8
	Urban	1,268	3,829	1,227,956	171,250	124,256	3,500	13,109	13,844	4 65	19.3
	Total	7,157	774,711	3,232,724	447,295	158,191	3,500	37,273	39,383	2 38	20.8
880	Rural	5,851	761,755	2,244,182	386,426	8,900	140	19,928	28,466	1 80	18.4
	Urban	1,394	3,819	1,269,382	198,690	119,197	4,217	13,629	13,702	4 55	18.6
	Total	7,245	765,574	3,513,564	585,116	151,097	4,357	33,557	42,168	2 31	18.5
1881	Rural	5,875	767,786	2,177,351	387,338	9,376	877	19,594	27,755	1 74	18.5
	Urban	1,535	3,843	1,274,582	214,995	118,377	3,948	12,828	11,879	3 96	16.6
	Total	7,410	771,629	3,451,933	602,333	150,003	4,825	32,422	39,634	2 16	17.8
1882	Rural	5,845	779,860	2,187,497	419,939	9,980	648	17,395	28,902	1 72	17.8
	Urban	1,613	3,790	1,314,912	236,325	118,377	5,818	13,553	12,036	3 99	16.5
	Total	7,458	783,650	3,502,409	656,264	149,857	6,466	30,948	40,938	2 15	17.7
1883	Rural	6,020	807,954	2,184,837	387,262	8,850	400	22,563	28,271	1 87	19.8
	Urban	1,758	3,562	1,367,078	244,950	53,847	2,500	12,043	14,743	3 61	16.6
	Total	7,778	811,516	3,551,915	632,212	82,903	2,900	34,606	43,014	2 24	18.5
LANARK:											
1873	Rural	4,720	610,716	2,042,243	625,646	900	900	20,338	30,790	2 40	19.2
	Urban	2,358	6,060	1,209,798	294,820	15,724	200	14,867	11,220	2 78	17.3
	Total	7,078	616,776	3,252,041	920,466	16,624	1,100	35,205	42,010	2 52	18.5
1874	Rural	4,844	632,161	2,975,224	541,685	900	.....	17,932	35,042	2 46	15.1
	Urban	2,407	6,042	1,567,995	339,165	18,000	.....	18,673	12,964	3 38	16.6
	Total	7,251	638,203	4,543,219	880,800	18,900	.....	36,605	48,006	2 74	15.6
1875	Rural	4,905	625,249	4,114,721	744,929	900	.....	22,253	31,884	2 49	11.1
	Urban	3,014	6,024	2,075,878	478,784	29,994	2,025	17,150	11,706	3 10	11.3
	Total	7,919	631,273	6,190,599	1,223,713	30,894	2,025	39,403	43,590	2 67	11.2
1876	Rural	5,026	638,084	4,249,434	647,373	1,150	.....	19,507	31,338	2 36	10.4
	Urban	2,729	5,515	2,275,513	427,670	46,834	2,020	16,695	27,168	4 65	16.3
	Total	7,755	643,599	6,524,947	1,075,043	47,984	2,020	36,202	58,506	3 06	12.5
1877	Rural	5,120	634,726	4,382,704	649,261	2,525	.....	23,528	29,375	2 48	10.5
	Urban	2,774	5,528	2,291,598	404,488	37,400	11,313	22,296	14,037	3 74	13.5
	Total	7,894	640,254	6,674,302	1,053,749	39,925	11,313	45,824	43,412	2 87	11.5
1878	Rural	5,291	629,451	4,632,838	607,117	2,095	.....	22,465	27,603	2 35	9.6
	Urban	2,820	5,650	2,180,385	333,598	44,600	1,200	25,446	17,340	4 43	17.0
	Total	8,111	635,101	6,813,223	940,715	46,695	1,200	47,911	44,943	3 00	12.0
1879	Rural	5,246	635,998	4,685,684	597,013	.....	591	23,047	26,177	2 31	9.3
	Urban	2,824	5,672	2,180,388	319,465	41,350	1,296	25,098	17,331	4 47	17.0
	Total	8,070	641,670	6,866,072	916,478	41,350	1,887	48,145	43,508	2 97	11.8
1880	Rural	5,312	644,955	4,629,897	534,468	1,800	.....	23,858	28,908	2 48	10.2
	Urban	2,637	5,735	2,175,962	317,985	37,150	.....	23,665	16,541	4 14	16.1
	Total	7,949	650,690	6,805,859	852,453	38,950	.....	47,523	45,449	3 00	12.1

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes levied for— Municipal Purposes.	Amount of Taxes levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
				$	$	$	$	$	$	$ c.	Mills.
LANARK.—*Continued.*											
1881	Rural	5,261	643,608	4,479,362	557,803	1,150	.....	20,941	28,874	2 39	9.9
	Urban	2,626	5,635	2,177,751	327,397	51,225	.....	22,776	16,248	3 97	15.6
	Total	7,887	649,303	6,657,113	885,200	52,375	.....	43,717	45,122	2 90	11.8
1882	Rural	5,314	629,743	4,473,274	607,135	.....	.....	21,897	27,662	2 43	9.7
	Urban	2,964	5,420	2,216,879	363,442	48,600	.....	24,028	16,123	4 08	15.6
	Total	8,278	635,163	6,690,153	970,577	48,600	.....	45,925	43,785	2 95	11.7
1883	Rural	5,319	635,861	4,613,904	660,233	.....	.....	22,243	29,120	2 45	9.7
	Urban	2,957	5,778	2,370,964	398,950	58,000	.....	26,988	25,569	4 67	19.0
	Total	8,276	641,639	6,984,868	1,059,183	58,000	.....	49,231	54,689	3 23	12.9
VICTORIA:*											
1873	Rural	6,406	616,464	3,498,645	348,268	107,457	4,946	50,495	34,667	3 33	22.1
	Urban	901	1,600	784,340	123,445	35,900	15,150	9,078	4,033	3 22	14.3
	Total	7,307	618,064	4,282,985	471,713	219,357	47,728	59,573	38,700	3 32	20.7
1874	Rural	6,367	661,413	3,731,096	351,254	157,006	485	50,176	41,333	3 48	22.4
	Urban	1,104	2,025	865,109	153,440	150,340	12,447	17,098	6,598	4 30	28.5
	Total	7,471	663,438	4,596,205	504,694	383,346	12,932	67,274	47,931	3 62	22.6
1875	Rural	5,975	674,863	6,957,922	546,276	123,044	7,166	52,346	36,996	3 59	11.9
	Urban	1,642	2,871	1,323,614	213,775	163,840	17,113	24,603	9,070	4 21	21.9
	Total	7,617	677,734	8,281,536	760,051	362,884	60,279	76,949	46,066	3 74	15.6
1876	Rural	6,110	684,038	8,109,217	547,208	121,050	5,556	54,887	40,638	3 90	11.0
	Urban	1,686	2,878	1,618,361	202,750	177,115	15,419	22,803	12,162	4 45	19.2
	Total	7,796	686,916	9,727,578	749,958	459,165	48,975	77,690	52,800	4 04	12.5
1877	Rural	6,224	690,535	7,719,564	482,900	98,505	5,128	61,774	36,681	3 85	12.0
	Urban	1,882	3,370	1,830,310	246,020	175,750	21,939	27,671	10,284	4 36	18.3
	Total	8,106	693,905	9,549,874	728,920	435,255	57,067	89,445	46,965	3 98	13.3
1878	Rural	6,711	716,780	7,421,964	429,477	125,030	6,017	62,392	39,821	4 02	13.0
	Urban	2,000	3,359	1,862,470	232,450	155,440	25,300	29,782	12,425	4 63	20.1
	Total	8,711	720,139	9,284,434	661,927	441,470	61,317	92,174	52,246	4 18	14.5
1879	Rural	6,888	718,664	7,601,287	442,807	139,572	5,618	62,610	41,694	3 99	13.0
	Urban	2,032	3,464	1,832,242	203,645	174,680	23,893	26,967	16,922	4 92	21.6
	Total	8,920	722,128	9,433,529	646,452	475,252	60,511	89,577	58,616	4 23	14.8
1880	Rural	6,840	743,684	7,442,973	413,846	121,073	5,776	60,862	37,732	3 71	12.5
	Urban	1,918	3,462	1,833,910	215,957	179,554	28,179	29,098	18,722	5 43	23.3
	Total	8,758	747,146	9,276,883	629,803	461,627	61,955	89,960	56,454	4 14	14.8
1881	Rural	6,902	744,480	8,143,995	423,688	128,789	3,958	62,326	35,712	3 67	11.4
	Urban	2,004	3,460	1,845,514	235,115	178,979	15,967	27,856	15,961	4 92	21.1
	Total	8,906	747,940	9,989,509	658,803	449,168	50,269	90,182	51,673	3 98	13.3
1882	Rural	6,813	747,778	8,052,143	428,263	119,681	5,386	63,522	38,941	3 85	12.1
	Urban	2,076	3,584	1,829,951	238,675	186,373	20,888	27,553	13,884	4 81	20.0
	Total	8,889	751,362	9,882,094	666,938	427,054	44,792	91,075	52,825	4 09	13.6
1883	Rural	6,929	751,420	8,103,670	465,747	122,082	5,106	58,384	38,603	3 70	11.4
	Urban	2,102	3,517	1,787,965	245,040	174,673	8,951	29,147	20,004	5 43	24.2
	Total	9,031	754,937	9,891,635	710,787	397,755	49,798	87,531	58,607	4 14	13.9

* Including portions of Muskoka throughout, and portions of Haliburton in 1873.

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.	Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes Levied for— Municipal Purposes.	Amount of Taxes Levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
PETERBOROUGH:			$	$	$	$	$	$	$ c.	Mills.
*1873 Rural	4,651	753,992	2,118,140	391,881	1,335	785	37,794	22,821	2 90	24.1
*1873 Urban	1,683	2,233	1,528,903	455,785	167,015	10,450	19,707	4,830	3 50	12.4
*1873 Total	6,334	756,225	3,647,043	847,666	208,350	19,931	57,501	27,651	3 05	18.9
1874 Rural	4,135	442,997	1,898,980	379,745	.....	1,787	32,760	20,440	2 88	23.3
1874 Urban	1,927	2,230	1,752,717	519,885	154,430	4,500	20,115	12,718	4 06	14.4
1874 Total	6,062	445,227	3,651,697	899,630	192,430	34,282	52,875	33,158	3 24	18.9
1875 Rural	4,172	467,752	7,173,501	671,067	2,081	1,015	34,802	22,506	3 29	7.3
1875 Urban	2,174	2,756	2,583,083	579,191	235,700	27,948	20,996	8,592	3 22	9.4
1875 Total	6,346	470,508	9,756,584	1,250,258	273,781	46,039	55,798	31,098	3 26	8.7
1876 Rural	4,148	486,149	6,673,468	656,557	2,644	3,126	29,636	26,498	3 10	7.7
1876 Urban	2,110	2,764	2,647,244	528,531	250,600	29,806	19,020	10,654	3 29	9.3
1876 Total	6,258	488,913	9,320,712	1,185,088	286,244	67,879	48,656	37,152	3 16	8.2
1877 Rural	4,228	491,717	7,050,427	651,686	1,893	2,976	30,733	25,790	3 13	7.3
1877 Urban	2,195	2,771	2,748,957	465,445	221,555	22,160	22,884	16,807	4 37	12.3
1877 Total	6,423	494,488	9,799,384	1,117,131	255,448	40,565	53,617	42,597	3 54	8.8
1878 Rural	4,551	502,515	6,899,852	632,600	1,790	2,229	29,456	25,023	3 04	7.2
1878 Urban	2,396	3,194	2,965,189	417,733	189,610	14,513	27,933	18,411	4 77	13.7
1878 Total	6,947	505,709	9,865,041	1,050,333	223,400	40,140	57,389	43,434	3 65	9.2
1879 Rural	4,623	517,240	7,045,950	597,052	2,665	2,081	33,238	25,081	3 18	7.6
1879 Urban	2,588	3,167	2,921,182	343,890	189,300	13,661	22,305	19,688	4 38	12.9
1879 Total	7,211	520,407	9,967,132	940,942	223,965	44,019	55,543	44,769	3 59	9.2
1880 Rural	4,683	521,161	6,909,090	584,609	5,913	1,685	31,712	24,569	2 96	7.5
1880 Urban	2,494	3,159	2,845,560	348,725	186,500	18,281	22,337	16,176	4 09	12.1
1880 Total	7,177	524,320	9,754,650	933,334	224,413	45,818	54,049	40,745	3 34	8.9
1881 Rural	4,539	520,760	6,983,305	540,869	5,344	10,444	32,621	24,167	3 09	7.7
1881 Urban	2,543	3,151	2,847,618	402,363	186,100	26,572	21,906	12,984	3 56	10.7
1881 Total	7,082	523,911	9,830,923	943,232	223,444	59,797	54,527	37,151	3 25	8.5
1882 Rural	4,560	517,253	6,972,534	611,268	5,175	9,276	34,253	23,582	3 11	7.6
1882 Urban	2,674	3,181	2,895,408	459,968	187,160	34,667	21,904	16,474	3 82	11.4
1882 Total	7,234	520,434	9,867,942	1,071,236	224,335	69,279	56,157	40,056	3 41	8.8
1883 Rural	4,716	520,311	6,718,061	620,702	561	8,524	30,516	23,993	2 99	7.4
1883 Urban	2,849	3,134	3,150,325	486,304	184,270	22,147	30,973	20,409	4 72	14.1
1883 Total	7,565	523,445	9,868,386	1,107,006	216,831	52,921	61,489	44,402	3 63	9.6
HALIBURTON:										
1874 Rural	766	307,745	292,570	16,955	.....	.....	6,315	4,411	3 45	34.7
1874 Total	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1875 Rural	927	479,023	472,615	27,374	.....	2,992	7,604	3,869	3 28	22.1
1875 Total	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1876 Rural	1,050	490,634	584,432	23,029	.....	2,735	10,685	5,037	3 64	25.9
1876 Total	.....	.....	.....	.....	58,425	.....	.....	.....	.....	.....
1877 Rural	1,131	517,254	603,991	33,528	.....	.....	11,326	4,832	3 59	25.3
1877 Total	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Including portions of Haliburton.

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.		Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes Levied for— Municipal Purposes.	Amount of Taxes Levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
HALIBURTON.—*Con.*				$	$	$	$	$	$	$ c.	Mills.
1878	Rural	1,293	507,287	636,591	23,440	.....	.....	12,006	5,161	3 60	26 0
	Total	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1879	Rural	1,350	533,258	607,357	34,331	.....	.....	12,726	5,794	3 66	28.9
	Total	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1880	Rural	1,389	525,197	601,334	21,858	52	3,875	13,588	7,765	4 02	34.3
	Total	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1881	Rural	1,324	525,211	606,487	17,432	.....	6,109	14,607	6,731	4 09	34 2
	Total	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1882	Rural	1,324	523,942	595,085	22,236	.....	12,996	16,104	7,983	4 43	39.0
	Total	.....	.....	.....	.....	5,842	19,460	.....	.....	.....	.....
1883	Rural	1,387	524,606	419,160	32,561	948	9,638	16,193	8,424	4 84	54.5
	Total	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
HASTINGS:											
1873	Rural	7,579	748,393	3,571,288	385,214	4,549	6,629	66,846	43,795	3 53	26.7
	Urban	738	1,640	360,668	30,950	13,000	800	5,607	5,593	3 19	28.6
	Total	8,317	750,033	3,931,956	416,164	164,949	7,429	72,453	49,388	3 50	28.0
1874	Rural	7,687	732,891	3,952,439	354,820	9,204	640	60,721	45,399	3 33	24.6
	Urban	846	1,740	362,189	32,100	11,000	900	5,564	11,426	4 46	43.0
	Total	8,533	734,631	4,314,628	386,920	169,854	1,540	66,285	56,825	3 45	26.2
1875	Rural	7,598	739,065	5,857,588	448,846	9,199	5,124	57,499	43,436	3 11	16.0
	Urban	905	1,540	381,793	51,964	26,000	50	6,015	3,937	2 42	22.9
	Total	8,503	740,605	6,239,381	500,810	194,802	5,174	63,514	47,373	3 03	16.4
1876	Rural	7,740	779,368	9,179,805	655,088	10,192	4,495	64,420	43,121	3 23	10.9
	Urban	986	1,740	627,127	50,800	28,040	80	6,355	5,898	2 88	18.1
	Total	8,726	781,108	9,806,932	705,888	185,632	34,602	70,775	49,019	3 19	11.4
1877	Rural	8,162	761,710	8,822,012	515,765	12,392	7,024	66,641	44,498	3 39	11.9
	Urban	999	1,740	634,230	40,800	27,950	600	6,519	5,260	2 89	17.4
	Total	9,161	763,450	9,456,242	556,565	236,742	7,624	73,160	49,758	3 33	12.3
1878	Rural	8,628	781,264	8,696,582	498,334	16,200	7,954	78,947	39,892	3 66	12 9
	Urban	1,203	2,327	802,930	29,150	29,350	6,240	9,832	6,070	3 43	19.1
	Total	9,831	783,591	9,499,512	527,484	256,550	33,833	88,779	45,962	3 63	13.4
1879	Rural	8,729	794,396	8,799,844	417,191	71,125	1,300	83,503	42,328	3 79	13.6
	Urban	1,207	2,148	808,182	24,500	45,623	1,300	9,574	7,985	3 51	21.1
	Total	9,936	796,544	9,608,026	441,691	329,148	2,600	93,077	50,313	3 75	14.3
1880	Rural	8,816	841,798	8,903,642	456,890	55,265	1,704	86,298	44,396	3 95	14.0
	Urban	1,357	2,075	810,875	14,980	43,800	1,822	11,894	8,879	3 88	25.1
	Total	10,173	843,873	9,714,517	471,870	273,665	3,526	98,192	53,275	3 94	14.9
1881	Rural	8,926	833,645	8,958,478	441,465	34,114	13,427	86,047	45,886	4 05	14.0
	Urban	1,543	2,602	866,620	48,550	55,650	611	14,131	7,083	3 58	23.2
	Total	10,463	836,247	9,825,098	490,015	284,364	15,657	100,178	52,969	3 98	14.8
1882	Rural	8,926	854,115	8,906,040	492,321	58,086	11,386	86,411	45,022	4 09	14.0
	Urban	1,590	3,482	1,205,379	49,760	52,010	4,767	16,306	7,989	3 73	19.4
	Total	10,516	857,597	10,111,419	542,081	275,096	17,772	102,717	53,011	4 04	14.6

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Continued.*

COUNTIES.	Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxes Levied for— Municipal Purposes.	Amount of Taxes Levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $.
HASTINGS.—*Continued.*			$	$	$	$	$	$	$ c.	Mills.
Rural	9,316	895,492	9,373,693	515,893	67,752	19,051	88,992	46,322	4 30	13.7
1883 Urban	1,892	3,310	1,229,382	32,800	49,850	5,500	16,502	10,844	3 88	21.7
Total	11,208	898,802	10,603,075	548,603	251,602	26,170	105,494	57,166	4 23	14.6
CITIES.										
BELLEVILLE:										
1873	2,013	1,495	2,686,128	166,350	166,000	20,020	38,508	14,329	6 32	18.5
1874	2,437	1,495	2,686,128	166,350	206,295	107,905	38,508	9,440	5 74	16.8
1875	2,184	1,495	3,715,222	236,050	254,000	89,115	51,367	11,912	6 48	17.0
1876	2,232	1,495	3,562,545	151,750	267,000	94,750	48,286	14,160	6 76	16.8
1877	2,180	1,495	3,604,993	143,285	269,500	84,517	52,510	21,521	8 12	19.8
1878	2,128	1,495	3,647,442	134,825	272,000	74,284	56,734	14,189	7 78	18.7
1879	2,140	1,495	3,639,256	121,300	275,000	91,964	58,289	16,193	7 45	19.8
1880	2,178	1,495	3,390,202	83,900	410,000	16,159	46,032	13,469	5 96	17.1
1881	2,280	1,495	3,534,266	126,500	410,000	25,020	51,251	17,726	6 87	18.8
1882	2,324	1,495	3,509,788	101,450	410,000	19,222	51,009	15,107	6 60	18.5
1883	2,310	1,495	3,575,580	113,350	405,000	11,980	52,106	16,143	7 20	18.5
BRANTFORD:										
1877	1,825	1,781	2,796,480	562,130	214,000	.....	36,945	16,932	5 07	16.0
1878	1,848	1,781	2,891,050	598,080	214,018	10,395	38,380	13,636	4 82	14.9
1879	1,875	1,781	2,927,150	550,680	259,018	18,825	38,256	27,316	6 19	18.8
1880	1,880	1,781	2,976,130	551,330	259,218	22,037	38,802	17,532	5 32	16.0
1881	1,953	1,781	2,987,320	643,171	259,218	22,752	43,566	17,939	6 12	16.9
1882	1,999	1,781	3,048,910	652,290	264,218	17,667	44,414	19,463	5 88	17.3
1883	2,063	1,781	3,175,540	762,700	264,318	6,020	47,254	18,046	5 95	16.6
GUELPH:										
1879	2,421	3,210	2,818,850	249,700	271,342	.....	58,302	16,538	7 43	24.3
1880	2,364	3,210	2,602,170	240,000	282,662	.....	45,475	15,271	5 92	21.4
1881	2,374	3,210	2,599,270	245,730	265,101	.....	56,900	16,057	7 25	25.6
1882	2,374	3,210	2,611,060	251,450	274,808	.....	37,213	16,288	5 43	18.7
1883	2,486	3,210	2,680,140	289,800	284,816	.....	33,041	15,569	4 93	16.3
HAMILTON:										
1873	8,183	2,300	9,971,700	2,703,710	2,396,049	.....	177,456	33,583	6 99	16.6
1874	8,683	2,300	11,037,420	2,812,620	2,331,762	.....	221,601	46,480	8 39	19.4
1875	8,533	2,300	11,525,450	2,620,430	2,345,772	.....	240,480	41,723	8 90	19.9
1876	8,000	2,300	11,804,090	2,552,210	2,321,781	.....	208,166	40,666	7 63	17.3
1877	8,271	2,300	12,177,606	2,537,520	2,430,535	.....	213,369	50,528	7 87	17.9
1878	8,677	2,400	12,682,948	2,783,870	2,391,964	.....	224,269	50,804	8 21	17.8
1879	8,500	2,400	12,601,640	2,566,570	2,362,505	.....	246,483	46,400	8 55	19.3
1880	8,756	2,400	12,659,180	2,398,750	2,471,604	.....	233,398	47,828	8 03	18.7
1881	8,853	2,400	12,964,280	2,682,200	2,463,104	.....	234,697	53,000	8 00	18.4
1882	9,400	2,400	13,383,335	2,914,380	2,449,491	.....	244,466	62,850	8 32	18.9
1883	9,929	9,929	14,316,440	3,396,710	2,420,795	.....	267,911	65,000	8 72	18.8
KINGSTON:										
1873	3,674	1,688	3,635,045	1,288,477	577,933	117,574	65,483	11,375	6 48	15.6
1874	3,923	1,688	3,833,056	1,157,368	437,779	132,906	65,643	14,974	6 92	16.1
1875	4,032	1,688	3,958,625	1,101,172	443,999	41,796	67,295	14,383	6 79	16.1
1876	4,835	1,688	4,098,288	1,185,181	436,899	73,631	70,270	14,057	6 59	16.0
1877	4,984	1,688	4,258,941	1,095,954	452,867	33,768	71,673	15,805	6 60	16.3
1878	4,617	1,688	4,356,404	986,399	443,566	74,997	70,899	15,292	6 12	16.1
1879	4,576	1,688	4,403,637	1,077,032	433,966	61,526	73,441	16,092	6 24	16.3
1880	4,617	1,688	4,412,630	1,026,775	423,667	49,565	72,779	16,756	6 43	16.5
1881	4,548	1,688	4,419,360	1,046,517	412,767	18,643	72,368	18,088	6 34	16.5
1882	4,714	1,688	4,514,830	1,203,452	401,166	28,129	76,282	17,848	6 44	16.5
1883	4,983	1,688	4,681,410	1,335,095	388,867	2,000	80,260	18,182	6 74	16.4

TABLE No. XXXV.—ASSESSMENT AND TAXATION.—*Concluded.*

CITIES.	Number of Ratepayers.	Number of Acres.	Assessed Value of—		Bonded Debt.	Floating Debt.	Amount of Taxes Levied for—		Rate of Taxation for Municipal and School Purposes—	
			Real Property.	Personal Property.			Municipal Purposes.	School Purposes.	Per head of Population.	Mills on $.
			$	$	$	$	$	$	$ c.	Mills.
London:										
1873	5,611	1,252	5,579,873	1,798,118	1,150,788	108,276	88,536	23,342	6 42	15.2
1874	5,238	1,252	5,849,460	1,755,630	1,150,788	136,577	114,076	23,421	7 59	18.1
1875	5,467	1,252	6,368,885	1,727,250	1,150,788	111,749	145,730	17,469	8 86	20.2
1876	5,418	1,252	6,750,188	1,734,883	1,150,788	83,376	132,367	21,347	8 45	18.1
1877	5,635	1,252	7,067,195	1,710,400	1,150,788	127,819	124,203	26,588	8 02	17.2
1878	5,700	1,252	7,291,880	1,687,480	1,506,398	102,790	152,649	26,898	9 36	20.0
1879	5,660	1,252	7,361,665	1,233,000	1,506,218	117,952	153,415	27,035	9 18	21.0
1880	5,622	1,262	7,550,485	1,635,550	1,506,398	7,575	160,756	31,201	9 63	20.9
1881	6,225	1,252	7,896,216	2,2[illegible]703	1,506,[illegible]99	180,456	180,450	38,484	10 85	21.5
1882	5,778	1,252	8,158,890	2,247,550	1,506,023	209,603	175,869	48,824	11 01	21.6
1883	6,551	1,252	8,546,279	2,633,537	2,197,292	193,923	166,579	39,166	10 13	18.4
Ottawa:										
1873	6,095	1,829	7,531,207	1,933,670	1,273,440	150,243	131,089	41,988	7 80	18.3
1874	6,416	1,829	8,328,820	1,348,800	736,[illegible]08	200,917	147,584	75,191	9 41	23.0
1875	7,447	1,829	9,958,395	1,461,650	1,023,542	155,696	168,255	57,048	9 29	19.7
1876	7,527	1,829	10,392,188	1,292,150	1,973,124	248,573	158,907	49,894	8 56	17.9
1877	7,527	1,829	11,262,480	1,709,425	1,049,584	248,436	194,579	44,224	9 75	18.4
1878	8,000	1,829	10,620,591	1,118,305	2,187,000	545,000	184,888	45,289	9 21	19.6
1879	8,000	1,829	10,964,540	1,555,455	2,187,300	214,280	195,842	44,611	9 99	19.2
1880	9,000	1,829	9,447,697	742,450	2,115,000	184,953	152,852	40,544	8 05	19.0
1881	9,000	1,829	9,485,000	933,000	2,115,090	121,271	161,479	37,377	8 02	19.1
1882	9,025	1,829	9,577,745	1,004,150	2,117,849	133,037	158,728	46,843	8 04	19.4
1883	9,050	1,829	9,742,515	954,950	2,120,848	55,060	160,462	55,329	8 43	20.2
St. Catharines:										
1876	2,469	2,265	3,610,155	786,500	806,372	28,156	62,652	21,656	8 59	19.2
1877	2,266	2,400	3,709,705	779,780	516,561	6,778	69,587	17,589	8 59	19.4
1878	2,752	2,400	3,941,000	737,950	601,001	7,518	66,909	20,180	7 86	18.6
1879	2,620	2,400	3,915,850	678,100	600,032	24,015	64,315	19,000	7 95	18.1
1880	2,554	2,400	3,903,610	683,237	599,544	21,485	66,509	16,645	7 94	18.1
1881	2,519	2,400	3,516,600	544,860	605,788	11,723	59,907	19,559	7 93	19.6
1882	2,585	2,400	3,616,500	534,000	605,767	9,400	62,257	18,482	8 43	19.4
1883	3,314	2,400	3,884,388	736,970	608,294	15,186	74,866	19,800	9 42	20.5
St. Thomas:										
1873	1,173	950	1,406,030	223,900	132,100	.....	20,048	5,650	4 91	15.8
1874	1,174	950	1,406,030	170,600	132,100	7,399	22,073	4,573	5 09	16.9
1875	1,250	950	1,501,580	246,000	132,100	12,000	22,893	5,070	5 35	16.0
1876	1,297	1,100	1,541,680	230,600	132,100	14,100	20,381	5,990	4 77	14.9
1877	1,359	1,100	1,680,780	237,740	132,100	13,300	22,063	14,684	6 17	19.2
1878	1,539	1,100	1,718,160	251,000	142,100	12,500	24,615	11,886	5 66	18.5
1879	1,586	1,100	1,876,075	280,300	140,650	15,000	23,720	9,720	4 63	15.5
1880	1,749	1,100	2,007,005	311,200	139,850	8,750	25,500	10,014	4 40	15.3
1881	1,989	1,450	2,207,651	332,100	199,000	30,621	30,477	13,040	4 51	17.1
1882	2,138	1,450	2,557,185	421,500	212,926	25,807	34,553	14,956	5 13	16.6
1883	2,336	1,450	2,732,460	427,746	208,157	49,811	36,658	13,975	4 98	16.0
Toronto:										
1873	22,643	4,867	31,925,734	12,840,108	2,797,717	.....	503,616	60,702	9 01	12.6
1874	23,817	4,867	33,844,535	9,617,977	4,104,531	429,254	548,281	69,554	9 01	14.1
1875	25,457	4,867	36,560,652	9,945,628	4,485,192	522,414	575,515	86,226	9 64	14.2
1876	25,515	4,867	37,969,401	9,180,961	5,378,955	993,210	612,955	78,269	9 64	14.7
1877	24,916	4,867	38,715,253	8,899,140	6,271,309	164,318	833,252	88,320	13 68	19.4
1878	25,050	4,867	40,291,884	8,761,881	6,216,803	637,122	1,158,895	134,953	18 26	26.4
1879	25,100	4,867	41,212,757	8,539,735	6,519,496	184,208	758,725	97,465	11 60	17.2
1880	25,292	4,867	42,020,155	8,146,484	6,319,009	185,173	727,416	128,200	11 39	17.1
1881	27,340	4,867	44,151,187	9,389,724	6,523,558	344,608	749,573	121,250	11 32	16.3
1882	25,771	4,867	45,968,926	9,985,973	6,861,139	327,388	723,917	152,178	10 77	15.7
1883	27,981	5,632	51,261,047	10,683,616	6,974,289	629,463	785,923	180,280	10 53	15.6

ASSESSMENT AND TAXATION.

TABLE No. XXXVI.—Summary of assessment, taxation, etc., for the Province for the eleven years, 1873-83.

THE PROVINCE.	Number of Ratepayers.	Number of Acres.	Assessed Value of— Real Property.	Assessed Value of— Personal Property.	Bonded Debt.	Floating Debt.	Amount of Taxation levied for— Municipal Purposes.	Amount of Taxation levied for— School Purposes.	Rate of Taxation for Municipal and School Purposes— Per head of Population.	Rate of Taxation for Municipal and School Purposes— Mills on $
			$	$	$	$	$	$	$ c.	Mills.
1873 County					4,224,880	269,173				
1873 Rural	248,647	19,506,201	195,387,274	20,914,075	1,440,778	188,235	1,793,070	1,609,906	3 25	15.7
1873 Urban	112,065	168,747	107,282,029	29,522,838	11,066,567	610,451	1,660,577	542,226	5 42	16.1
1873 Total	360,712	19,674,948	302,669,303	50,436,913	16,732,225	1,067,859	3,453,647	2,152,132	3 86	15.9
1874 County					4,121,427	433,290				
1874 Rural	258,679	19,614,826	206,892,278	20,463,878	1,360,670	158,791	1,805,891	1,688,274	3 29	15.4
1874 Urban	120,893	174,174	118,591,838	26,546,894	11,977,543	1,318,752	1,922,506	677,305	5 89	17.9
1874 Total	379,572	19,789,000	325,484,116	47,010,772	17,459,640	1,910,833	3,728,397	2,365,579	4 05	16.4
1875 County					3,952,504	239,345				
1875 Rural	257,450	19,836,955	302,603,212	25,127,418	1,517,224	188,063	1,906,785	1,605,914	3 28	10.7
1875 Urban	133,313	183,906	136,204,770	28,078,489	13,503,698	1,266,984	2,143,109	730,245	6 09	17.5
1875 Total	390,763	20,020,861	438,807,982	53,205,907	18,973,426	1,694,392	4,049,894	2,336,159	4 14	13.0
1876 County					4,430,962	270,086				
1876 Rural	263,200	20,071,639	340,225,773	25,691,102	1,421,100	119,736	1,963,989	1,627,754	3 31	9.8
1876 Urban	136,339	193,336	146,112,360	27,012,028	15,765,361	1,873,334	2,182,409	749,054	5 94	16.9
1876 Total	399,539	20,264,975	486,338,133	52,703,130	21,617,423	2,263,156	4,146,398	2,376,808	4 13	12.1
1877 County					4,171,606	274,915				
1877 Rural	275,093	20,193,616	355,516,686	25,152,600	1,591,269	114,805	2,026,068	1,629,524	3 31	9.6
1877 Urban	138,827	194,917	152,689,531	26,606,239	16,103,934	1,000,968	2,486,211	826,330	6 47	18.5
1877 Total	413,920	20,388,533	508,206,217	51,758,839	21,866,809	1,390,688	4,512,279	2,455,854	4 31	12.4
1878 County					4,268,378	236,452				
1878 Rural	285,511	20,333,820	368,910,409	24,992,557	1,824,723	168,580	2,113,030	1,582,907	3 32	9.4
1878 Urban	147,164	202,067	158,319,819	26,034,306	17,843,317	1,818,995	2,918,935	900,082	7 23	20.7
1878 Total	432,675	20,535,887	527,230,228	51,026,863	23,936,418	2,224,027	5,031,965	2,482,989	4 58	13.0
1879 County					4,293,501	265,527				
1879 Rural	289,011	20,507,434	373,917,706	23,766,593	2,157,879	181,396	2,131,859	1,585,646	3 31	9.4
1879 Urban	150,662	205,384	163,592,258	24,472,236	18,513,657	1,068,353	2,556,079	883,782	6 32	18.3
1879 Total	439,673	20,712,818	537,509,964	48,238,829	24,965,037	1,515,276	4,687,938	2,469,428	4 29	12.2
1880 County					4,183,303	117,322				
1880 Rural	289,705	20,617,201	374,774,517	22,922,642	1,958,818	217,791	2,123,123	1,597,654	3 31	9.4
1880 Urban	151,680	208,078	163,891,262	23,446,027	18,576,377	841,064	2,459,738	931,213	6 14	18.1
1880 Total	441,385	20,825,279	538,665,779	46,368,649	24,718,498	1,176,177	4,582,861	2,528,867	4 24	12.2
1881 County					3,891,970	239,243				
1881 Rural	291,435	20,657,857	383,795,107	23,794,163	2,281,063	297,852	2,093,374	1,594,721	3 28	9.1
1881 Urban	157,787	211,663	168,468,223	26,543,747	18,956,602	1,068,122	2,547,964	933,589	6 22	17.9
1881 Total	449,222	20,869,520	552,263,330	50,337,910	25,159,635	1,605,217	4,647,338	2,528,310	4 26	11.9
1882 County					3,749,925	179,013				
1882 Rural	292,197	20,613,955	389,577,732	24,948,198	2,177,137	352,937	2,119,545	1,618,560	3 37	9.0
1882 Urban	160,559	219,765	176,101,062	27,851,465	19,484,224	1,135,033	2,598,920	994,424	6 25	17.6
1882 Total	452,756	20,833,720	565,678,794	52,799,663	25,411,286	1,666,983	4,718,465	2,612,984	4 35	11.9
1883 County					3,655,797	291,622				
1883 Rural	295,312	20,862,848	400,446,524	26,351,197	2,277,186	428,580	2,220,021	1,651,373	3 51	9.1
1883 Urban	167,872	221,790	182,784,609	30,120,464	20,433,701	1,372,728	2,744,499	1,072,542	6 42	17.9
1883 Total	463,184	21,084,638	583,231,133	56,471,661	26,366,684	2,092,930	4,964,520	2,723,915	4 53	12.0

NOTE.—The amount of taxation for Municipal and School purposes in this table and the preceding one includes the requirement of County Municipalities.

ASSESSED VALUATION.

TABLE No. XXXVII.—Showing the average assessed value per acre of Real Property in rural municipalities of the Province for the eleven years 1873-83.

COUNTIES.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.
	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.
Essex	15 93	11 71	11 55	10 82	10 68	11 13	10 71	10 78	10 13	8 13	7 11
Kent	20 88	18 93	17 77	17 57	17 12	17 21	17 04	17 12	8 87	7 17	6 67
Elgin	28 79	28 46	28 45	28 31	28 12	27 94	27 86	27 94	27 21	18 45	15 63
Norfolk	20 42	19 58	19 48	19 34	18 85	18 96	15 94	16 86	15 41	12 01	11 66
Haldimand	24 77	24 69	24 90	25 47	24 54	25 14	22 77	22 68	22 38	12 16	11 99
Welland	28 75	29 80	28 19	23 70	25 66	21 76	20 84	21 54	21 59	19 61	19 60
Lambton	18 37	15 73	13 18	13 09	12 67	13 01	12 44	8 41	7 14	6 56	6 71
Huron	30 94	31 09	30 32	30 01	30 02	29 74	29 73	28 78	27 91	11 23	10 01
Bruce	20 88	20 57	21 32	20 72	21 04	20 02	18 76	18 89	18 18	10 64	9 30
Grey	11 80	11 89	9 53	9 02	9 02	8 63	8 61	8 12	8 05	6 98	6 50
Simcoe	11 11	11 16	10 66	10 57	10 34	10 36	9 80	7 92	7 54	6 95	6 89
Middlesex	29 45	29 53	28 88	27 81	26 62	25 40	24 11	24 10	19 35	13 25	13 09
Oxford	40 86	40 82	40 25	40 44	40 87	40 66	40 59	39 37	37 52	21 16	20 31
Brant	41 73	41 10	39 34	38 65	39 55	40 14	39 27	37 29	36 12	26 17	25 71
Perth	34 46	34 16	34 28	34 42	34 47	32 06	30 58	28 47	27 95	16 71	17 08
Wellington	21 48	20 38	20 30	19 46	18 27	17 01	16 84	15 87	14 57	11 34	11 55
Waterloo	27 74	28 26	27 79	27 81	27 54	27 98	27 40	27 60	21 87	20 38	20 37
Dufferin	11 91	11 84	12 21	8 87	.....	.....	.....	.....	.....	.....	.....
Lincoln	23 53	23 65	22 94	23 36	23 37	23 33	23 90	23 84	23 72	21 83	22 33
Wentworth	40 56	35 38	35 02	33 99	34 00	34 71	33 15	33 41	33 24	21 07	21 10
Halton	33 24	33 24	33 53	30 89	26 63	27 03	25 48	24 98	19 89	18 66	19 94
Peel	31 24	31 25	30 93	30 58	30 71	29 77	29 79	29 85	25 34	24 53	20 46
York	44 28	43 80	42 77	43 06	43 45	43 63	42 56	42 04	28 41	23 76	21 77
Ontario	30 87	30 89	30 55	32 32	32 75	33 26	32 92	30 97	31 00	16 26	14 81
Durham and Northumberland	27 08	27 09	26 96	26 42	27 11	27 18	27 31	27 36	23 38	13 41	11 17
Prince Edward	25 00	25 23	24 50	24 70	24 47	25 17	27 17	25 16	24 91	17 73	18 13
Lennox and Addington	16 38	16 23	16 25	15 96	15 49	15 47	14 51	13 37	10 37	8 61	8 96
Frontenac	7 08	7 44	7 61	7 39	7 62	7 20	6 60	5 89	4 43	4 46	4 54
Leeds and Grenville	13 28	12 72	13 13	13 17	13 56	13 64	13 98	13 19	14 82	7 79	7 60
Dundas, Stormont and Glengarry	15 76	15 92	16 09	15 83	15 94	16 13	10 52	9 75	7 95	7 76	7 69
Prescott and Russell	7 73	7 22	7 71	5 52	5 58	5 74	4 90	4 52	4 25	4 03	3 83
Carleton	12 93	12 17	12 10	12 15	12 22	12 62	12 78	8 42	7 02	6 49	6 40
Renfrew	2 70	2 80	2 84	2 95	2 60	2 86	2 74	2 86	2 92	1 86	1 73
Lanark	7 26	7 10	6 96	7 18	7 37	7 36	6 90	6 66	6 58	4 71	3 34
Victoria	10 78	10 77	10 94	10 01	10 58	10 35	11 18	11 85	10 31	5 64	5 68
Peterborough	12 91	13 48	13 41	13 26	13 60	13 73	14 34	13 73	15 34	4 29	2 81
Haliburton	80	1 14	1 15	1 14	1 14	1 25	1 17	1 19	99	95	.....
Hastings	10 47	10 43	10 75	10 58	11 08	11 14	11 58	11 78	7 92	5 39	4 77
The Province	19 19	18 90	18 58	18 18	18 23	18 14	17 61	16 95	15 25	10 55	10 02

POPULATION.

TABLE No. XXXVIII.—Population of the Province by County, Township, Villlage, Town and City Municipalities, as taken by Assessors for the thirteen years, 1872-84.

MUNICIPALITIES.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
ESSEX:													
Anderdon	2,152	2,064	2,045	2,003	1,962	1,875	1,816	1,637	1,750	1,507	1,164	1,495	1,396
Colchester, N	1,394	2,040	1,702	1,514	1,326	3,861	3,484	3,315	3,271	3,315	3,080	2,699	2,113
Colchester, S	2,486	2,434	2,386	2,461	2,535								
Gosfield	3,529	3,390	3,172	3,345	3,517	3,396	2,772	3,682	3,469	3,384	3,236	3,047	2,903
Maidstone	2,881	2,945	2,986	2,993	3,000	2,691	2,709	2,535	2,351	2,019	2,008	1,947	2,065
Malden	1,528	1,562	1,535	1,531	1,527	1,502	1,529	1,533	1,571	1,443	1,390	1,515	1,365
Mersea	3,485	3,558	3,300	3,143	2,986	2,841	2,702	2,500	2,533	3,040	2,900	2,500	2,429
Pelee Island	403	407	301	330	360	260	.....	.....	.....	.....	.....	.....	.....
Rochester	2,341	2,232	2,103	2,018	1,933	2,155	1,933	1,918	2,004	1,961	2,320	1,864	1,571
Sandwich, E	3,760	3,880	4,087	3,843	3,600	3,620	3,568	3,361	3,276	3,016	2,961	3,008	3,068
Sandwich, W	2,459	2,362	2,420	2,366	2,311	2,370	2,370	2,360	2,431	1,703	1,961	1,861	1,893
Tilbury, W	4,086	3,983	3,760	3,530	3,301	3,123	2,953	2,862	2,748	2,652	2,449	2,246	2,152
Rural	30,504	30,857	29,797	29,077	28,358	27,688	25,836	25,703	25,395	24,040	23,469	22,182	20,955
Amherstburg	2,469	2,586	2,660	2,543	2,426	2,229	2,145	1,975	2,330	2,307	2,025	1,989	1,725
Sandwich	1,099	1,136	1,049	1,038	1,028	1,071	1,096	1,155	1,203	1,160	1,109	960	952
Windsor	7,057	6,890	6,740	6,283	5,826	6,166	6,166	6,394	6,193	6,123	6,043	5,126	4,564
Belle River	700	616	625	605	585	603	502	473	.....	.....	.....	.....	.....
Essex Centre	1,123	.....	.....	.....	...	.....	.....	.....	.....	.....	.....	.....	.....
Kingsville	871	843	798	822	845	840	788	.....	.....	.....	.....	.....	.....
Leamington	1,076	1,076	1,111	1,152	1,160	1,145	967	958	.....	.....	.....	.....	...
Urban	14,395	13,147	12,983	12,443	11,870	12,054	11,664	10,955	9,726	9,590	9,177	8,075	7,241
Total	44,899	44,004	42,780	41,520	40,228	39,742	37,500	36,658	35,121	33,630	32,646	30,257	28,196
KENT:													
Camden	2,654	2,617	2,844	2,616	2,579	2,633	2,501	2,712	2,110	2,030	1,811	2,961	2,762
Chatham	4,799	4,653	4,895	4,871	5,048	4,813	4,687	4,644	4,045	4,311	4,202	4,253	4,365
Dover	3,229	3,051	3,231	3,429	3,218	3,533	3,416	3,301	3,219	3,165	3,038	2,988	2,594
Harwich	4,327	4,706	4,777	4,999	5,617	4,982	4,875	4,630	4,168	4,654	5,461	5,083	5,049
Howard	3,437	3,607	3,444	4,232	3,708	3,555	3,553	3,310	4,161	3,910	3,909	3,851	4,233
Orford	2,919	2,941	2,617	2,880	2,926	2,915	2,830	2,811	2,779	2,511	2,334	2,332	2,530
Raleigh	4,271	4,294	4,704	4,570	4,313	4,203	4,013	3,854	3,937	3,868	4,070	3,502	3,743
Romney	1,014	1,020	1,003	961	892	913	845	837	790	1,020	729	702	642
Tilbury, E	3,006	2,749	2,517	2,521	2,477	2,145	2,237	2,004	1,908	2,009	1,902	1,836	1,704
Zone	1,259	1,268	1,255	1,355	1,378	1,155	1,284	1,202	1,194	1,150	1,108	998	998
Rural	30,915	30,906	31,287	32,434	31,556	30,847	30,241	29,305	28,311	28,628	28,564	28,506	28,620
Bothwell	989	956	890	851	1,029	1,021	931	937	883	827	892	902	1,004
Chatham	8,979	7,950	7,739	7,656	7,572	7,265	7,325	6,989	7,057	6,802	6,775	6,081	5,816
Dresden	1,665	1,606	1,747	1,829	1,592	1,696	1,256	1,271	1,047	1,129	1,009	931	780
Ridgetown	1,506	1,820	1,700	1,429	1,312	1,120	799	803	.....	.....	.....	.....	.....
Blenheim	1,125	1,125	1,050	1,010	1,341	1,199	1,038	884	1,031	906	.....	.....	.....
Thamesville	683	684	652	682	753	691	660	625	617	611	570	.....	.....
Wallaceburg	1,548	1,319	1,200	1,140	1,270	1,278	938	947	1,160	944	.....	.....	.....
Urban	16,495	15,460	14,978	14,597	14,869	14,270	12,947	12,456	11,795	11,219	9,246	7,914	7,600
Total	47,410	46,366	46,265	47,031	46,425	45,117	43,188	41,761	40,106	39,847	37,810	36,420	36,220
ELGIN:													
Aldborough	4,452	4,428	4,335	4,280	4,247	4,264	4,136	4,000	4,212	3,854	3,113	3,039	2,827
Bayham	3,949	4,006	3,432	3,830	4,589	4,457	4,480	4,455	4,112	4,291	4,111	4,143	4,350
Dorchester, S	1,540	1,631	1,651	1,716	1,758	1,721	1,663	1,905	1,897	1,835	1,799	1,800	2,000
Dunwich	3,213	3,644	3,629	3,649	3,858	3,697	3,902	3,886	3,890	3,620	3,500	3,318	3,043
Malahide	4,031	3,876	4,013	3,861	3,985	3,863	3,929	4,311	3,786	4,115	3,991	3,853	3,926
Southwold	4,289	4,219	4,399	4,442	4,454	4,598	4,538	4,533	4,369	4,081	4,098	3,733	3,961
Yarmouth	4,459	4,449	4,420	5,393	5,213	5,172	4,906	4,843	4,736	4,736	4,075	4,440	4,349
Rural	25,933	26,253	25,879	27,171	28,104	27,772	27,554	27,933	27,002	26,532	24,687	24,326	24,446
Aylmer	1,695	1,538	1,488	1,407	1,409	1,466	1,466	1,303	1,289	1,141	1,117	983	845
Port Stanley	543	582	698	650	758	755	767	707	726	600	.....	.....	.....
Springfield	487	521	527	474	400	750	750	.....	.....	.....	.....	.....	.....
Vienna	452	425	490	495	530	520	467	484	530	522	560	554	566
Urban	3,177	3,066	3,213	3,026	3,097	3,491	3,450	2,494	2,545	2,263	1,677	1,537	1,411
Total	29 110	29,319	29,092	30,197	31,201	31,263	31,004	30,427	29,547	28,795	26,364	25,863	25,857

NOTE.—Throughout this table local municipalities are given according to the present boundaries of Counties.

TABLE No. XXXVIII.—POPULATION.—*Continued.*

MUNICIPALITIES.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
NORFOLK :													
Charlotteville	3,783	3,658	3,904	3,903	4,002	3,926	3,943	3,827	3,681	3,800	3,770	3,294	3,408
Houghton	1,852	1,864	1,912	1,927	1,975	1,880	1,851	1,856	1,888	1,871	1,823	1,791	1,945
Middleton	3,151	3,369	3,208	3,309	3,351	3,208	3,156	3,077	3,009	2,900	2,893	2,760	2,687
Townsend	4,387	4,263	4,397	4,530	4,609	4,219	5,374	5,303	4,965	4,855	5,020	5,137	4,840
Walsingham	4,798	4,368	4,981	4,956	5,472	5,500	5,330	5,229	5,294	5,119	5,072	4,938	4,774
Windham	4,120	3,909	4,158	4,296	4,060	4,023	4,019	4,208	4,034	4,150	4,180	3,999	3,990
Woodhouse	2,399	2,350	2,495	2,600	2,531	2,444	2,393	3,539	3,456	3,513	3,523	3,395	3,465
Rural	24,490	23,772	25 055	25,521	26 001	25,200	26,066	27,120	26,327	26,208	26,281	25,215	25,109
Simcoe	3,000	3,000	3,000	2,498	2,493	2,702	3,000	2,949	2,949	1,958	2,015	1,709	2,000
Port Dover	1,021	1,067	1,076	1 065	1,046	1 079	..	.....	.....	.....	.....	.....	.....
Waterford	1,319	1,235	1,110	1,110	1,052	912	946	.....	.....	.....	.....	.....	..
Urban	5,340	5,302	5,186	4,673	4,591	4,693	3,946	2,949	2,949	1,958	2,015	1,709	2,000
Total	29,830	29,074	30,241	30,194	30,592	29,893	30,012	30,069	28,376	28,166	28,296	26,924	27,109
HALDIMAND :													
Canborough	1,050	962	1,085	1,104	1,104	1,020	981	983	1,026	1,018	918	1,002	972
Cayuga, N	1,743	1,789	1,800	1,838	1,844	1,866	1,867	1,818	1,869	2,000	2,000	1,916	1,855
Cayuga, S	894	854	869	900	930	901	892	926	894	906	939	885	885
Dunn	891	980	936	936	910	908	828	868	1,000	1,032	868	959	913
Moulton	1,677	1,433	1,601	1,546	1,441	1,450	1,529	1,951	1,322	1,678	1,757	1,761	1,752
Sherbrooke	445	420	457	465	480	474	461	495	468				
Oneida	1,875	2,068	2,012	2,021	2,051	2,082	2,123	2,324	2,124	2,148	2,060	2,085	2,085
Rainham	1,863	1,877	1,909	1,927	1,900	1,841	1,863	1,846	1,826	1,740	1,789	1,891	1,768
Seneca	2,293	2,347	2,323	2,469	2,345	2,740	2,758	2,793	2,825	2,873	2,914	2,677	2,565
Walpole	4,708	4,825	5,097	5,051	5,257	5,258	5,159	4,777	4,786	5,115	4,684	4,515	4,515
Rural	17,439	17,555	18,089	18,257	18,262	18,540	18,461	18,781	18,140	18,510	17,929	17,593	17,310
Caledonia	910	886	978	1,102	1,152	1,153	1,148	1,171	1,217	1,167	1,215	1,169	1,085
Cayuga	800	769	753	758	752	801	841	901	914	865	944	899	855
Dunnville	1,574	1,624	1,611	1,591	1,480	1,708	1,670	1,657	1,598	1,645	1,665	1,643	1,586
Urban	3,284	3,279	3,342	3,451	3,384	3,662	3,659	3,729	3,729	3,677	3,824	3,621	3,526
Total	20,723	20,834	21,431	21,708	21,646	22,202	22,120	22,510	21,869	22,187	21,753	21,214	20,836
WELLAND :													
Bertie	3,751	3,700	3,661	3,469	3.211	3,407	3,425	3,320	3,315	3,000	3,000	2,489	3,000
Crowland	1,213	1,221	1,253	1,185	1,166	1,120	1,112	1,149	1,153	1,231	1,149	988	1,181
Humberstone	2,666	2,563	2,862	3,298	3,495	3,449	2,927	2,141	2,513	2,513	2,319	2,318	2,323
Pelham	2,305	2,260	2,337	2,406	2,436	2,436	2,422	2,358	2,371	2,166	2,279	2,320	2,247
Stamford	1,673	1,702	1,852	2,836	2,618	2,682	2,614	2,545	2,749	2,619	2,610	2,587	2,568
Thorold	1,976	2,106	2,106	2,502	2,488	2,785	2,569	2,342	2,462	2,449	2,496	2,388	2,346
Wainfleet	2,667	2,454	2,400	2,331	2,326	2,200	2,269	2,369	2,168	1,374	1,304	1,816	2,003
Willoughby	947	1,104	1,101	1,024	1,086	1,129	1,129	995	1,075	1,060	1,048	1,005	1,033
Rural	17,198	17,110	17,572	19,042	18,826	19,199	18,458	17,214	17,606	16,403	16,205	15,912	16,701
Niagara Falls	2,365	2,170	2,155	2,200	2,186	2,087	2,059	2,070	2,090	1,715	1,715	1,639	1,555
Thoroid	2,541	2,547	2,468	2,471	2,794	2,874	3,050	2,994	3,049	1,895	1,881	1,732	1,468
Welland	2,149	1,872	1,781	1,876	1,972	2 500	2,600	2,466	2,239	1,675	1,634	1,539	1,250
Chippewa	706	553	608	631	651	718	814	825	773	749	802	841	942
Fort Erie	707	675	562	600	619	766	842	709	760	767	899	927	906
Niagara Falls, South	948	873	868	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port Colborne	1.239	1,263	1,189	1,520	1,773	1,866	1,661	1,421	1,276	1,254	1,137	1,012	1,009
Urban	10,655	9,953	9,631	9,298	9,995	10,811	11,026	10,476	10,187	8,055	8,059	7,490	7,164
Total	27,853	27,063	27,203	28,340	28,821	30,010	29,484	27,690	27,793	24,458	24,264	23,402	23,865
LAMBTON :													
Bosanquet	2,712	2,734	2,831	2,863	2,896	2,882	2,921	3,209	3,099	2,974	2,814	2,555	3,420
Brooke	3,227	2,966	2,933	3,005	3,080	3,039	3,068	3,059	2,811	2,856	2,602	2,375	2,362
Dawn	1,892	1,917	1,943	1,850	1,758	1,648	1,512	1,655	1,300	1,372	1,160	1,012	1,061
Enniskillen	2,769	2,494	2,662	2,576	2,490	2,544	2,500	2,800	1,979	1,906	1,703	1,782	1,784
Euphemia	2,510	2,481	2,364	2,497	2,630	2,636	2,509	2,569	2,498	2,395	2,203	2,218	2,218
Moore	4,517	4,506	4,804	4,919	5,035	5,091	4,796	4,625	4,564	3,744	4,331	4,329	4,142
Plympton	3,911	3,904	4,136	4,165	4,197	4,043	4,013	4,045	3,882	3,906	4,185	4,171	4,274
Sarnia	1,889	2,094	2,027	2,202	2,377	2,363	3,402	3,558	3,134	3,000	2,942	2,663	2,684
Sombra	3,358	3,289	3,188	2,988	2,788	2,739	3,042	2,708	3,139	3,036	2,700	2,295	2,315
Warwick	3,333	3,427	3,597	3,649	3,701	3,674	3,411	3,638	3,708	3,632	3,529	4,059	3,563
Rural	30,118	29,812	30,482	30,714	30,982	30,659	31,174	31,896	30,094	28,821	28,160	27,439	27,993
Petrolia	3,656	2,889	2,906	3,081	3,257	3,094	3,303	4,024	2,396	2,346	2,869	3,086	4,239
Sarnia	5,318	5,173	4,530	4,270	4,010	4,115	4 016	3,156	4,019	3,836	3,591	2,983	3,100
Alvinston	937	925	859	750	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arkona	607	569	550	595	641	686	578	563	.....	.....	.....	.....	.....

TABLE No. XXXVIII.—POPULATION.—*Continued.*

MUNICIPALITIES.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
LAMBTON.—*Continued.*													
Forest	1,536	1,524	1,428	1,402	1,377	1,460	1,632	1,470	1,450	1,088	1,088	688	.....
Oil Springs	570	622	471	514	558	523	537	537	451	432	555	581	555
Point Edward	1,661	1,545	1,423	1,389	1,355	1,167	.....	.....	.....	.....	.....	.....	.....
Thedford	764	750	705	711	656	592	500	.....	.....	.....	.....	.....	.....
Watford	1,190	1,110	1,500	1,405	1,310	985	911	911	922	907	962	.....	.....
Wyoming	763	758	678	764	850	850	800	850	675	615	681	.....	.....
Urban	17,002	15,845	15,110	14,881	14,014	13,472	12,277	11,511	9,913	9,224	9,696	7,338	7,894
Total	47,120	45,657	45,592	45,595	44,966	44,131	43,451	43,407	40,007	38,045	37,856	34,777	35,887
HURON:													
Ashfield	3,803	3,742	3,792	3,719	3,628	3,911	3,846	3,819	3,721	3,537	3,702	3,278	3,326
Colborne	2,230	2,170	2,401	2,114	2,175	2,231	2,200	2,147	1,990	1,985	2,071	2,058	2,001
Goderich	2,621	2,641	2,686	2,785	2,752	2,648	2,754	2,821	2,935	2,792	2,912	2,828	2,953
Grey	3,728	3,821	3,887	4,026	4,047	4,207	3,942	3,942	3,965	3,671	3,521	3,482	3,355
Hay	3,343	3,357	3,396	3,486	3,495	3,644	3,543	3,463	3,245	3,224	3,092	3,102	3,247
Howick	5,000	5,001	5,035	5,256	5,193	5,305	5,420	5,348	5,143	5,235	5,791	5,495	5,465
Hullett	2,863	3,012	3,029	3,373	3,378	3,301	3,394	3,401	3,410	3,150	2,978	3,103	3,129
McKillop	3,486	3,543	3,185	3,699	3,682	3,551	3,588	3,632	3,529	3,369	3,257	3,283	3,283
Morris	3,231	3,246	3,267	3,444	3,372	3,243	3,255	3,262	3,430	3,327	3,441	3,111	3,428
Stanley	2,364	2,485	2,366	2,400	2,373	2,283	2,397	2,397	3,090	2,952	2,863	3,330	3,330
Stephen	3,646	3,703	3,829	3,775	3,644	3,826	3,843	4,006	3 729	4,316	4,306	3,124	3,124
Tuckersmith	2,972	3,117	3,100	3,248	3,317	3,161	3,128	3,096	3,081	2,992	2,904	3,086	3,086
Turnberry	2,678	2,603	2,292	2,355	2,467	2,527	2,614	2,632	2,503	2,394	2,540	3,063	2,732
Usborne	2,703	2,721	2,890	2,763	2,740	2,755	2,616	2,656	2,667	2,617	2,785	2,609	3,007
Wawanosh, E.	2,009	2,071	2,250	2,304	2,329	2,350	2,345	2,412	2,538	2,523	2,546	2,483	2,433
Wawanosh, W.	2,205	2,229	2,261	2,284	2,352	2,499	2,555	2,555	2,478	3,240	3,206	2,488	2,488
Rural	48,932	49,462	49,597	51,031	50,944	51,592	51,440	51,589	51454	51,424	51,915	49,923	50,387
Clinton	2,659	2,501	2,502	2,598	2,400	2,457	2,592	2,538	2,581	2,386	2,241	1,954	1,920
Goderich	3,845	3,818	4,180	4,195	4,328	4,432	4,662	5,003	5,015	4,732	4,410	4,290	4,195
Seaforth	2,362	2,376	2,356	2,414	2,349	2,348	2,311	2,330	2,150	2,060	1,761	2,004	1,522
Wingham	2,500	1,915	1,939	1,953	2,038	2,083	2,010	2,072	1,233	1,600	900	.....	.....
Bayfield	705	671	694	694	632	591	550	780	672	.....	.....	.....	.....
Blyth	981	1,090	1,113	1,161	1,264	1,121	1,150	900	.....	.....	.....	.....	.....
Brussels	1,284	1,313	1,282	1,335	1,291	1,429	1,206	1,135	900	1,003	731	644	.....
Exeter	1,637	1,635	1,587	1,586	1,578	1,682	1,562	1,458	1,342	1,217	958	854	.....
Wroxeter	457	453	495	568	600	634	650	607	611	557	.....	.....	.....
Urban	16,430	15,772	16,148	16,504	16,480	16,777	16,724	16,823	14,504	13,555	11,061	9,746	7,645
Total	65,362	65,234	65,745	67,535	67,424	68,369	68,164	68,412	65,958	64,979	62,916	59,669	58,032
BRUCE:													
Albemarle	1,065	1,076	750	794	838	813	666	1,020	760	713	667	606	545
Eastnor	987	833											
Lindsay and Bury St. Edmunds	469	552	1,276	1,197	1,118	953	662						
Amabel	1,936	2,066	2,045	1,862	1,680	2,090	2,090	2,032	1,975	1,930	1,885	1,674	1,458
Arran	2,883	2,759	2,974	3,237	3,501	3,573	3,573	3,470	3,367	3,287	3,207	3,120	3,034
Brant	4,257	4,533	4,631	4,687	4,743	4,783	4,799	4,743	4,688	4,578	4,468	4,362	4,255
Bruce	3,801	3,688	3,529	3,650	3,771	3,598	3,830	3,300	3,597	3,512	3,427	3,740	3,452
Carrick	4,756	4,649	4,892	4,940	4,989	5,278	5,177	5,016	4,855	4,740	4,625	4,227	4,029
Culross	3,098	3,227	3,227	3,287	3,347	3,320	3,375	3,795	3,715	3,627	3,540	3,295	2,950
Elderslie	3,180	2,788	3,006	3,022	3,038	3,594	3,493	3,296	3,100	2,979	2,858	2,917	2,977
Greenock	3,068	2,906	2,892	2,965	3,038	3,090	3,087	3,068	3,050	3,025	3,000	2,804	2,607
Huron	3,907	4,135	4,277	4,259	4,241	4,260	4,267	3,910	3,552	3,474	3,387	3,335	3,283
Kincardine	3,388	3,401	3,335	3,575	3,814	4,230	4,035	4,035	4,020	4,010	4,000	4,048	4,097
Kinloss	2,840	3,190	3,252	3,265	3,279	3,261	3,087	3,019	2,952	2,772	2,812	2,750	2,687
Saugeen	1,890	1,855	1,911	1,841	1,771	1,824	1,841	1,821	1,801	1,758	1,715	2,515	2,515
Rural	41,525	41,658	41,997	42,581	43,168	45,176	44,482	42,525	41,432	40,405	39,591	39,493	37,884
Kincardine	2,383	2,383	2,539	2,593	2,648	2,560	2,500	2,437	2,375	2,212	2,050	1,792	1,535
Walkerton	2,709	2,370	2,652	2,612	2,572	2,396	2,537	2,431	2,325	1,770	1,514	1,187	1,070
Chesley	1,270	932	838	789	740	.....	.....	.....	.....	.....	.....	.....	.....
Lucknow	1,326	1,326	1,260	1,164	1,068	1,117	1,110	1,055	1,000	906	.....	.....	.....
Paisley	1,018	931	963	943	923	981	1,168	1,084	1,000	900	.....	.....	.....
Port Elgin	1,661	1,535	1,470	1,394	1,319	1,450	1,564	1,473	1,382	1,091	800	.....	.....
Southampton	1,097	1,097	1,125	1,116	1,108	942	884	838	792	756	700	770	840
Tara	639	623	626	688	.....	.....	.....	.....	.....	.....	.....	.....	.....
Teeswater	926	926	926	918	909	982	915	925	935	830	.....	.....	.....
Tiverton	560	542	536	632	728	850	834	834	.....	.....	.....	.....	.....
Wiarton	1,209	1,044	985	977	968	.....	.....	.....	.....	.....	.....	.....	.....
Urban	14,798	13,709	13,920	13,826	12,983	11,218	11,512	11,077	9,809	8,459	5,064	3,749	3,445
Total	56,323	55,367	55,917	56,407	56,151	56,394	55,994	53,602	51,241	48,864	44,655	43,242	41,329

TABLE No. XXXVIII.—POPULATION.—*Continued.*

MUNICIPALITIES.	1884.	1883.	1882.	1881	1880.	1879.	1878	1877.	1876.	1875.	1874.	1873.	1872.
GREY:													
Artemesia	3,760	3,652	3,829	3,817	3,866	3,914	3,674	3 602	3,418	3,500	3,602	3,238	3,238
Bentinck	4,553	4,508	4,647	4,721	4,450	4,234	4,050	4,510	4,225	4,500	4,100	4,105	4,105
Collingwood	4,184	4,009	4,103	4,366	4,095	4,251	4,102	4,102	3,884	3,814	3,591	2,828	2,828
Derby	2,060	1,949	1,959	1,955	2,031	2 040	2,046	2,120	1,836	1,582	1,565	1,691	1,691
Egremont	3,498	3,508	3,716	3,754	3,785	3,780	3,758	3,664	3,716	3,718	3,210	3,270	3,270
Euphrasia	3,025	3,162	3,006	3,051	3,850	3,775	3,740	3,675	3,394	3,185	3,020	2,775	2,775
Glenelg	3,583	3,743	3,786	3,725	3,711	3,705	3,735	3,484	3,328	3,428	3,074	3,348	3,348
Holland	3,313	3,186	3,058	3,120	3,182	3,155	2,864	2,970	3,310	3,385	3,295	3,150	3,150
Keppel	3,134	2,992	3,070	3,102	3,068	3,198	3,032	2,881	2,505	2,284	2,050	1,913	1,913
Normanby	4,935	5,153	5,255	5,815	5,804	5,700	5,400	5,276	5,169	5,099	5,099	3,700	3,700
Osprey	3,552	3 388	3,268	3,494	3,484	3,430	3,465	3,420	3,280	3,240	2,995	2,915	2,915
Proton	3,198	2,855	3,093	2,906	3,053	3,230	2,672	2,120	2,407	2,059	2,223	2,143	2,143
St. Vincent	3,572	3,648	3,672	3,349	3,652	3,586	3,617	3,635	3,353	3,108	4,865	4,769	4,769
Sarawak	999	907	865	846	709	876	755	781	694	700	708	641	641
Sullivan	3,426	3,547	3,464	3,527	3,564	3,558	3,464	3,341	3 393	3,305	3,316	3,075	3,075
Sydenham	3,949	3,825	4,045	3,860	3,756	3,822	3,795	3,814	3,867	3,522	3,643	3,573	3,573
Rural	54,732	54,022	54,834	55,288	56,061	56,263	54,161	53,345	51,479	50,439	50,446	47,134	47,134
Durham	1,051	960	1,082	1,033	984	965	88	870	862	779	808	847	847
Meaford	2,124	1,815	1,904	1,790	1,649	1,628	1 736	1,634	1,425	1,499			
Owen Sound	4,655	4,519	4,511	4,309	4,584	4,548	4,320	4,207	4,252	4,220	3,997	3,819	3,819
Urban	7,830	7,294	7,497	7,132	7,217	7,141	6,942	6,711	6,539	6,498	4,805	4,666	4,666
Total	62,562	61,316	62,331	62,520	63,278	63,404	61,104	60,056	58,018	56,937	55,251	51,800	51,800
SIMCOE:													
Adjala	2,225	2,214	2,215	2,210	2,234	2,215	2,260	2,100	2,148	2,115	2,184	1,800	1,808
Essa	3,905	3,850	3,826	3,826	3,708	3,708	4,000	3,833	2,641	2,847	3,000	2,863	2,838
Flos	2,601	2,605	2,451	2,383	2,353	2,229	2,148	1,936	1,917	1,797	1,614	1,499	1,655
Gwillimbury, W.	2,704	2,500	2,417	2,871	2,676	2,438	2,483	2,511	2,344	2,252	2,177	2,407	2,407
Innisfil	4,434	4,326	4,346	4,624	4,440	4,616	4,800	5,038	5,581	4,740	5,035	5,000	4,797
Medonte	2,953	2,811	2,932	2,755	2,777	2,771	2,643	2,348	2,534	2,437	2,272	2,098	1,935
Nottawasaga	5,807	5 724	5,319	5,339	5,262	5,332	5,352	5,415	5,069	4,885	4,612	4,482	5,425
Orillia and Matchedash	3,010	2,918	2,365	2,354	2,326	2,348	2,311	2,236	2,000	2,163	2,125	1 906	1,906
Oro	3,896	3,931	4,015	4,119	3,968	3,809	3,872	4,238	4,428	4,364	4,280	4,265	4,329
Sunnidale	2,630	2,548	2,543	2,628	2,674	2,535	2,535	2,380	1,992	1,820	1,829	1,663	1,467
Tay	2,431	2,234	1,965	1,904	1,564	1,594	1,634	1,962	1,275	1,637	1,082	1,014	867
Tecumseth	5,137	4 563	4,388	4,390	4,393	4,458	4,572	4,451	3,474	3,669	4,772	4,098	4,170
Tiny	2,842	2,877	2,804	2,832	2,619	2,588	2,556	2,686	2,645	2,954	2,859	2,713	2,705
Tossorontio	1,244	1,172	1,270	1,223	1,176	1,141	1,096	1,067	1,167	1,149	1,142	1,371	1 266
Vespra	2,574	2,629	2,520	2,548	2,657	2,217	2,324	2,390	2,371	2,150	2,140	2,051	1,839
Rural	48,393	46,902	45,376	46,006	44,827	43,999	44,586	44,591	41,586	40,979	41,123	39,230	39,414
Barrie	4,469	4,425	4,536	4,611	4,818	4,802	4,515	4,238	4,123	3,574	3 610	3,000	2,848
Collingwood	5,297	5,111	4,762	4,134	4,315	4,336	4,094	3,596	4,203	3,873	3,543	3.155	2,889
Orillia	3,200	3,200	2,900	2,900	2,900	2,749	2,559	2,519	2,441	2 185	2,237	2,255	1,632
Penetanguishene	1,762	1 660	1,151	980	809	939	543	502	730				
Alliston	1,477	1,400	1,168	985	1,140	1,120	1,072	609	651	684			
Bradford	950	905	926	1,025	1,124	1,322	1,350	1,164	1,164	1.048	1.194	933	933
Midland	1,314	859	1,264	953	806	799	948						
Stayner	888	1,031	1,009	1,008	1,006	830	978	1,069	1,112	1,155	1.026	867	
Urban	19,357	18,591	17,716	16,596	16,918	16,897	16,059	13,697	14,424	12,519	11,610	10,240	8,302
Total	67,750	65,493	63,092	62,602	61,745	60,896	60,645	58,288	56,010	53,498	52,733	59,470	47,716
MIDDLESEX:													
Adelaide	3,108	2,788	3,119	2,980	2,832	2,786	2,774	2,724	2.749	2,859	2,374	2,480	2,532
Biddulph	2,643	2,717	2,560	2,700	2,615	2,449	2,613	2,523	2,672	2,636	2,768	2,688	2,741
Caradoc	4,106	4,003	4,137	3,880	3,940	3,958	3,884	4,049	4,041	3,986	3,863	3,782	3,621
Delaware	1,678	1,697	1,687	1,687	1,854	1,676	1,570	1,703	1,559	1,558	1,402	1,527	1,564
Dorchester, N.	3,502	3,523	4,293	3,887	4,082	4,239	4,251	4,109	3,157	2,834	3,086	3,142	3,155
Ekfrid	2,695	2,736	2,721	2,806	2,798	2,850	2,750	2,685	2,858	2,640	2,778	2,625	2,800
Lobo	2,755	2,700	2,738	2,894	2,815	2,685	2,725	2,729	2,788	2,830	2,917	2,698	2,779
London	8,717	8,653	8,750	9,593	9,645	8,917	7,946	6,936	6,959	6,829	8,847	8,545	8,622
McGillivray	3,931	3,813	3,526	3,685	3,763	3,578	3,645	3,587	3,512	3,758	3,776	3 808	4,227
Metcalfe	1,895	1,988	2,100	2,195	2,223	2,037	2,006	2,142	2,318	2,153	2,212	2,212	2,305
Mosa	2,619	2,562	2,641	2,790	2,708	2,278	2,278	1,949	1,976	2,005	2,050	2,124	2,774
Nissouri, W.	3,405	3,162	3,134	3,550	3,426	3,475	3,000	2,983	3,200	3,011	3,000	3,000	3,000
Westminster	6,999	7,475	7,707	6,834	6,371	6,256	6,097	5,824	5,511	5,460	4,819	5,363	5,150
Williams, E.	1,722	1,831	1,955	1,881	1,881	1,753	1,716	1,953	1,739	1,908	2,124	2,222	2,250
Williams, W.	1,779	1,970	1,925	1,988	1,946	1,916	1,972	2,134	2,149	2,122	2,101	2,000	2,025
Rural	51,544	51,430	52,993	53,260	52,899	50,861	49,149	48,030	47,188	46,589	48,717	48,156	49,551

TABLE No. XXXVIII.—POPULATION.—*Continued.*

MUNICIPALITIES.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
MIDDLESEX.—*Continued.*													
London, East	4,822	4,510	4,254	3,663	3,651	3,507	3,328	3,048	2,723	1,479	.....	.....	.....
Strathroy	3,665	3,817	3,493	3,640	3,421	3,500	3,351	3,310	3,027	3,176	3,302	3,349	3,006
Ailsa Craig	740	762	730	838	899	923	874	711	677	581	.....	.....	.....
Glencoe	878	1,064	837	801	740	727	605	532	493	700	.....	.....	.....
London, West	1,494	1,825	1,679	1,603	1,578	1,329	1,140	1,188	1,040	980	.....	.....	.....
Lucan	897	897	873	900	1,070	1,071	1,012	1,100	1,012	930	990	750	750
Newbury	650	476	566	547	534	560	546	513	524	514	483	429	.....
Parkhill	1,557	1,716	1,471	1,522	1,561	1,604	1,626	1,626	1,600	1,265	1,516	1,614	1,000
Wardsville	434	404	415	474	560	540	475	500	521	454	493	432	489
Urban	15,135	15,471	14,312	13,988	14,014	13,761	12,957	12,528	11,617	10,079	6,784	5,974	5,245
Total	66,679	66,901	67,305	67,248	66,913	64,622	62,106	60,558	58,805	56,668	55,501	54,130	54,796
OXFORD:													
Blandford	1,802	1,726	1,811	1,855	1,861	1,587	1,626	1,727	1,713	1,720	1,684	1,698	1,671
Blenheim	4,903	4,976	4,924	5,086	4,880	5,028	4,735	4,440	5,266	5,229	5,238	5,270	5,432
Dereham	3,666	3,796	3,863	3,976	3,831	3,730	3,717	3,754	3,905	3,714	3,834	3,804	3,785
Nissouri, E.	2,588	2,602	2,628	2,612	2,735	2,649	2,643	2,758	2,868	2,915	2,976	2,925	3,466
Nissouri, W	2,225	2,139	2,124	2,129	2,192	2,124	2,189	2,094	2,144	2,694	2,693	2,638	2,689
Norwich, S	2,744	2,766	2,682	2,615	2,646	2,535	2,558	2,551	2,632	2,799	2,555	2,439	2,669
Oxford, E	2,009	1,998	2,096	2,081	2,087	2,184	2,122	2,184	2,017	2,886	2,293	2,111	2,165
Oxford, N	1,449	1,425	1,533	1,461	1,400	1,392	1,342	1,400	1,438	1,259	1,427	1,387	1,411
Oxford, W	2,321	2,402	2,072	2,263	2,085	2,484	2,300	2,426	2,405	2,436	2,350	2,548	2,336
Zorra, E.	3,765	4,000	4,142	3,774	3,652	3,567	3,447	3,621	3,872	4,001	4,204	4,200	4,258
Zorra, W	2,510	2,735	2,849	2,742	2,843	2,806	2,742	2,742	2,832	2,947	3,040	3,904	3,187
Rural	30,072	30,563	30,715	30,594	30 212	30,106	29,421	29,697	31,092	32,590	32,294	32,724	33,079
Ingersoll	4,388	4,359	4,353	4,949	5,188	5,157	5,029	5,015	4,909	4,778	4,570	4,548	4,649
Tilsonburgh	1,989	1,926	1,834	1,827	1,891	1,780	1,606	1,680	1,292	1,010	1,236	1,565	1,445
Woodstock	6,690	6,020	5,223	5,399	5,382	5,128	5,069	5,298	5,176	5,060	4,879	4,650	4,445
Embro	587	522	505	510	595	600	541	537	514	472	494	539	489
Norwich	1,326	1,265	1,265	1,316	1,021	1,101	980	944	665	.....	.....	.....	.....
Urban	14,380	14,092	13,180	14,001	14,077	13,766	13,225	13,474	12,556	11,320	11,179	11,302	11,028
Total	44,452	44,655	43,895	44,595	44,289	43,872	42,646	43,171	43,648	43,910	43,473	44,026	44,107
BRANT:													
Brantford	6,126	6,060	5,545	5,537	5,421	5,239	5,263	5,099	5,456	5,168	5,253	5,122	5,258
Burford	4,709	4,683	4,955	4,854	4,861	4,822	4,953	4,812	4,811	4,750	4,805	4,862	4,714
Dumfries, S.	3,344	3,295	3,247	3,448	3,474	3,465	3,121	3,037	3,044	2,878	2,842	2,980	2,859
Oakland	894	865	875	875	931	884	900	820	1,200	932	914	848	986
Onondaga	1,344	1,294	1,369	1,431	1,414	1,438	1,491	1,620	1,376	1,542	1,586	1,638	1,613
Rural	16,357	16,197	16,991	16,145	16,101	15,848	15,728	15,388	15,887	15,270	15,400	15,450	15,430
Paris (Urban)	3,343	3,533	3,070	3,962	3,098	3,103	2,952	3,090	3,082	3,071	2,947	2,819	2,721
Total	19,730	19,730	19,161	19,207	19,199	18,951	18,680	18,478	18,969	18,341	18,347	18,269	18,151
PERTH:													
Blanshard	2,811	2,853	2,812	2,967	3,121	2,955	2,970	3,242	3,142	3,000	3,000	3,000	3,000
Downie	2,765	2,878	3,187	2,928	3,095	3,170	3,346	3,137	3,223	2,708	2,998	2,805	3,161
Easthope, N	2,304	2,223	2,362	2,390	2,509	2,549	2,544	2,474	2,542	2,613	2,671	2,521	2,903
Easthope, S	1,703	1,751	1,778	1,729	1,829	1,884	1,825	1,676	1,720	1,747	1,804	1,732	1,787
Ellice	2,600	2,689	2,947	2,804	2,625	2,727	2,605	2,544	2,498	2,442	2,564	2,685	2,500
Elma	3,808	3,832	3,665	3,752	3,914	3,733	3,793	3,744	3,510	3,009	3,137	3,178	3,023
Fullarton	2,421	2,403	2,399	2,469	2,528	2,549	2,560	2,520	2,546	2,509	2,705	2,551	2,539
Hibbert	2,737	2,681	2,779	3,130	3,257	3,052	3,144	3,169	3,255	3,156	3,208	3,110	3,018
Logan	2,677	2,806	2,717	2,813	3,003	3,055	2,732	2,789	2,961	2,751	2,720	2,728	2,758
Mornington	3,258	3,199	3,250	3,586	3,968	3,799	3,848	3,757	3,687	3,458	3,568	3,500	3,508
Wallace	3,032	3,042	3,036	2,979	3,046	3,246	3,179	2,901	3,128	2,973	3,145	3,017	3,042
Rural	30,060	30,357	30,570	31,647	32,895	32,719	32,546	31,953	32,212	30,357	31,520	30,827	31,239
Listowel	2,577	2,578	2,409	2,462	2,696	2,663	2,625	3,140	2,366	2,500	2,054	1,960	1,100
Mitchell	2,230	2,309	2,244	2,377	2,435	2,307	2,366	2,221	2,206	2,320	2,145	2,046	1,577
St Marys	3,192	3,442	3,442	3,432	4,593	4,536	4,968	4,977	4,279	4,290	4,165	3,685	3,574
Stratford	8,698	8,472	9,000	8,954	8,912	8,885	8,645	8,442	7,729	7,301	6,600	6,101	6,101
Milverton	709	662	512	669	.....	.....	.....	.....	.....	.....	.....	.....	.....
Urban	17,528	17,463	17,607	17,894	18,636	18,448	18,604	18,780	16,580	16 411	14,964	13,792	12,352
Total	47,588	47,820	48,177	49,541	51,531	51,167	51,150	50,733	48,792	46,768	46,484	44,619	43,591

TABLE No. XXXVIII.—POPULATION.—*Continued.*

MUNICIPALITIES.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
WELLINGTON:													
Arthur	3,426	3,357	3,416	3,554	3,739	3,807	3,599	3,514	3,390	3,431	3,249	3,258	3,332
Eramosa	3,132	3,081	3,229	3,391	3,269	3,223	3,194	3,263	3,257	3,177	3,299	3,258	3,258
Erin	3,945	3,702	3,677	3,952	3,909	4,250	4,238	4,464	4,298	4,264	4,301	4,315	4,160
Garafraxa, W	3,031	3,135	3,124	3,216	3,150	2,973	3,150	2,970	3,097	2,993	2,890	2,500	2,810
Guelph	2,499	2,557	2,616	2,823	2,656	2,579	2,788	2,702	2,698	2,571	2,501	2,632	2,530
Luther, W	1,724	1,763	1,684	1,561	1,678	1,515	1,479	1,364	1,339	1,119	843	843	843
Maryborough	3,408	3,620	3,464	3,669	3,583	3,358	2,783	3,076	3,000	4,213	4,663	4,140	3,927
Minto	3,520	3,628	3,798	3,919	3 898	3,903	3,946	3,911	3,803	3,509	3,880	3,974	4,390
Nichol	2,286	2,058	2,176	2,157	2,205	2,219	2,182	2,260	2,170	2,214	2,195	2,314	2,411
Peel	3,859	4,020	4,116	4,382	4,107	4,169	4,095	4,095	4,095	4,144	4,415	4,503	4,886
Pilkington	1,792	1,643	1,756	1,792	1,819	1,837	1,881	1,948	1,814	1,821	1,846	1,846	2,014
Puslinch	3,298	3,266	3,283	3,258	3,466	3,370	3,300	3,470	3,291	3,339	3,254	3,280	4,007
Rural	35,920	35,830	36,333	37,674	37,429	37,203	36,535	37 037	36,252	36,795	37,336	36,863	38,568
Harriston	1,894	1,864	1,803	1,712	1,737	1,500	1,356	1,275	1,221	1,204	1,082	1,004	750
Mount Forest	2,088	2,204	2,204	2,194	2,171	1,909	1,903	1,796	1,890	1,722	1,653	1,585	1,400
Palmerston	1,716	1,699	1,727	1,743	1,759	1,555	1,601	1,601	1,065	1,103			
Arthur	1,183	1,140	1,145	1,265	1,264	1,273	1,198	1,099	891	745	508	497	459
Clifford	610	60	664	664	660	683	821	846	824	490	850		
Drayton	791	82	904	789	764	692	696	751	709	224			
Elora	1,419	1,40	1,478	1,390	1,510	1,476	1,490	1,612	1,547	1,502	1,534	1,530	1,506
Erin	556	52	503	406									
Fergus	1,663	1,65	1,66	1,732	1,783	1 688	1,701	1,741	1,819	1,660	1,611	1,640	1,550
Urban	11,920	11,927	12,189	11,895	11,648	10,776	10,766	10,721	9,966	8,710	7,238	6,256	5,665
Total	47,840	47,757	48 522	49,569	49,077	47,979	47,301	47,758	46,218	45,505	44,574	43,119	44,233
WATERLOO:													
Dumfries, N.	2,656	3,489	3,359	3,583	3,283	3,409	3,341	3,161	3,173	3,212	3,165	3,312	3,312
Waterloo	7,067	6,959	6,852	6,997	6,661	6,437	6,301	6,379	6,435	6,563	6,408	6,226	6,513
Wellesley	4,964	5,131	5,102	4,778	5,016	4,968	5,086	4,987	4,982	4,986	4,749	4,733	4,852
Wilmot	5,088	4,900	5,134	4,888	4,910	5,015	4,939	4,889	5,092	5,078	4,810	4,793	4,793
Woolwich	5,109	5,175	5,075	5,193	5,040	5,090	4,966	5,046	4,884	5,029	4,827	4,896	4,807
Rural	24,884	25,654	25,422	25,439	24,910	24,919	24,633	24,462	24,566	24,868	23,959	23,960	24,277
Berlin	4,473	4,326	3,906	4,079	3,911	3,946	3,893	3,780	3,579	3,538	3,202	2,978	2,907
Galt	5,893	5,550	5,215	4,983	4,736	4,509	4,527	4,499	4,428	4,737	4,328	4,137	4,013
Waterloo	2,158	2,158	2,103	2,012	1,959	1,901	1,899	1,966	1,800	1,700	1,634	1,600	1,539
Ayr	1,321												
Hespeler	926	867	789	642	597	634	605	602	543	545	583	717	635
New Hamburg	1,119	1,289	1,238	1,151	1,135	1,118	1,277	1,207	1,260	1,260	754	1,198	940
Preston	1,536	1,466	1,430	1,305	1,378	1,474	1,424	1,478	1,451	1,313	1,357	1,353	1,374
Urban	17,336	15,65	14,681	14,172	13,716	13,582	13,625	13,532	13,061	13,093	11,858	11,983	11,408
Total	42,220	41,310	40,103	39,611	38,626	38,501	38,258	37,994	37,627	37,961	35,817	35,943	35,685
DUFFERIN:													
Amaranth	2,650	2,254	2,391	2,504	2,617	2,617	2,553	2,371	2,248	2 262	1,909	1,980	2,245
Garafraxa, E	2,073	2,142	2,169	2,159	2,150	2,009	2,120	2,158	2,154	2,195	2,140	2,095	2,101
Luther, E	1,514	1,539	1,438	1,357	1,458	1,317	1,285	1,185	1,164	953	733	732	732
Melancthon	2,377	2,599	2,506	2,514	2,522	2,436	2,509	2,465	2,464	2,155	2,050	1,997	1,997
Mono	3,517	3,317	3,618	3,510	3,401	3,520	3,442	3,662	3,609	3,590	3,581	3,378	3,363
Mulmur	3,893	3,617	3,978	3,836	3,695	3,699	3,414	3,272	3,204	3,108	3,092	2,981	2,871
Rural	16,024	15,468	16,100	15,880	15,843	15,598	15,314	15,113	14,843	14,283	13,545	13,163	13,309
Orangeville	2,365	2,381	2,413	2,523	2,633	2,453	2,416	2,480	2,453	2,453	2,144	1,487	1,487
Shelburne	947	796	708	657	606	598							
Urban	3 312	3,177	3,121	3,180	3,239	3,051	2,416	2,480	2,453	2,453	2,144	1,487	1,487
Total	19,336	18,64	19,221	19,060	19,082	18,649	17,730	17,593	17,296	16,736	15,689	14,650	14,796
LINCOLN:													
Caistor	1,943	1,97	1,928	1,916	1,905	1,907	1,907	1,907	1,901	1,895	1,941	1,886	1,873
Clinton	2,061	1,996	2,011	2,091	2,165	2,142	2,782	2,782	2,782	2,682	2,55	2,491	2,491
Gainsborough	2,617	2,59	2,61	2,615	2,618	3,016	3,016	3,016	2,828	2,641	2,627	2,584	2,546
Grantham	1,932	1,86	2,087	2,083	2,079	2,451	2,451	2,451	2,757	3,064	3,068	3,879	3,845
Grimsby, N	928	97	2,30	2,327	2,264	2,480	2,493	2,507	2,451	3,039	2,653	2,520	2,634
*Grimsby, S	1,393	1,429											
Louth	1,534	1,88	1,690	1,664	1,638	1,893	1,893	1,893	1,718	1,543	1,592	1,5	1,578
Niagara	1 854	1,96	1,71	1,82	1,944	2,09	2,093	2,093	1,952	1,811	1,854	1,67	1,808
Rural	14,262	14,207	14,443	14,528	14,613	15,98	16,635	16,64	16,339	16,67	16,285	16,652	16,775

TABLE No. XXXVIII.—POPULATION.—*Continued.*

MUNICIPALITIES.	1884.	1883.	1882.	1881.	1880	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
LINCOLN.—*Continued.*													
Niagara	1,200	1,430	1,393	1,445	1,497	1,387	1,443	1,443	1,494	1,545	1,465	1,378	1,437
Beamsville	755	705	694	692	691	640	.....	.....	.....	.....	.....	.....	.....
Grimsby	784	757	654	645	636	643	630	616	630	.....	.....	.....	.....
Merritton	1,887	1,820	1,697	1,704	1,710	1,800	1,800	1,800	1,710	1,620	1,378	.....	.....
Port Dalhousie	947	985	1,007	1,000	992	1,800	1,500	1,500	1,263	1,026	1,187	1,028	971
Urban	5,573	5,697	5,445	5,486	5,526	6,270	5,373	5,359	5,097	4,191	4,030	2,406	2,408
Total	19,835	19,904	19,888	20,014	20,139	22,252	22,008	22,008	21,436	20,866	20,315	18,958	19,183
WENTWORTH:													
Ancaster	4,184	4,101	4,213	4,465	4,460	4,386	4,196	4,206	4,099	3,974	3,789	3,498	3,446
Barton	3,911	3,653	3,425	3,270	3,476	2,674	2,711	2,813	2,881	2,803	2,493	2,380	2,400
Beverley	4,772	4,671	4,890	5,100	5,118	4,537	4,621	4,989	4,895	5,118	4,533	4,420	4,583
Binbrook	1,598	1,521	1,511	1,643	1,629	1,536	1,532	1,545	1,515	1,524	1,582	1,609	1,710
Flamboro', E.	2,331	2,281	2,359	2,432	2,491	2,482	3,090	2,921	2,847	3,063	3,012	3,080	2,940
Flamboro', W.	3,168	3,119	3,235	3,364	3,341	3,222	3,232	3,455	3,065	3,126	3,025	3,079	3,155
Glanford	1,806	1,893	1,867	1,847	1,887	1,893	1,980	1,879	1,929	1,970	1,895	1,746	1,845
Saltfleet	2,467	2,450	2,614	2,587	2,368	2,259	2,551	2,570	2,587	2,451	2,185	2,415	2,250
Rural	24,237	23,689	24,114	24,708	24,770	22,989	23,913	24,378	23,809	24,029	22,514	22,227	22,329
Dundas	3,881	4,128	4,021	3,668	3,530	3,536	3,648	3,611	4,008	3,939	4,029	3,651	3,232
Waterdown	768	748	750	754	758	742	.....	.....	.....	.....	.....	.....	.....
Urban	4,649	4,876	4,771	4,422	4,288	4 278	3.648	3,611	4,008	3,939	4,029	3,651	3,232
Total	28,886	28,565	28,885	29,130	29,058	27,267	27,561	27,989	27,817	27,968	26,543	25,878	25,561
HALTON:													
Esquesing	4,429	4,397	4,448	4,585	4,742	4,774	4,726	4,775	4,730	4,938	4,982	5,836	5,688
Nassagaweya	2,626	2,659	2,708	2,748	2,809	2,710	2,705	2,762	2,732	2,964	2,964	2,748	2,551
Nelson	3,082	3,089	3,080	3,039	3,089	3,089	3,228	2,833	2,833	3,068	3,150	3,594	3,594
Trafalgar	3 973	4,018	4,125	4,384	4,334	4,337	4,231	4,256	3,764	3,913	3,715	3,802	3,826
Rural	14,110	14,163	14,361	14,756	14,974	14,910	14,890	14.626	14,059	14,883	14,811	15,980	15,659
Milton	1,251	1.198	1,125	1,192	1.258	1,272	1,266	1,067	1,002	1,009	981	891	890
Oakville	1,655	1,653	1,711	1,709	1 708	1,764	1,843	1,667	1,672	1.696	1,620	1,592	1,556
Acton	918	848	838	805	775	752	739	743	797	772	753	.....	.....
Burlington	1,057	968	1,024	1,046	1,071	1,025	995	980	973	1,023	845	.....	.....
Georgetown	1,573	1,552	1,467	1,562	1,612	1,608	1,616	1,630	1,322	1,350	1,402	1,405	1,317
Urban	6,454	6,219	6,165	6,314	6,424	6.421	6,459	6,087	5.766	5,850	5.601	3.888	3,693
Total	20,564	20,382	20,526	21,070	21,398	21,331	21,349	20,713	19,825	20,733	20,412	19,868	19,352
PEEL:													
Albion	3,118	3,112	3,186	3,189	3.172	3,295	3,346	3.465	3,324	3,237	3,454	3,526	3,441
Caledon	3,684	3,641	3,617	3,568	3,954	3,903	3,839	3,895	3,824	3 807	3,637	3,662	3,687
Chinguacousy	4,959	4,795	4,747	5,005	5,002	5,154	5,210	4,992	5,071	4,881	5,105	5,084	5,276
Toronto	5,235	5,122	5,169	5,343	5,253	5 368	5,428	5,296	5.526	5,321	5,165	5,208	5,183
Toronto Gore	1,151	1,134	1,203	1,245	1 187	1,253	1,262	1,261	1,283	1,303	1,164	1,213	1,341
Rural	18,147	17,804	17,922	18.350	18,568	18,973	19,085	18,909	18,928	18,549	18,525	18,693	18 928
Brampton	3,248	3,022	3,169	2,966	3,128	3,004	3,009	2,718	2,431	2,390	2,518	2,317	2 428
Bolton	643	622	549	560	559	781	790	787	791	796	750	675	795
Streetsville	751	740	706	655	693	675	617	643	678	625	656	617	584
Urban	4,642	4,384	4,424	4,181	4,380	4,460	4,416	4,148	3,900	3,811	3,924	3,609	3.807
Total	22,789	22.188	22,346	22,531	22,948	23,433	23,501	23,057	22.828	22.360	22,449	22,302	22,735
YORK:													
Etobicoke	2,953	2.855	2,787	2,728	2 694	2,615	2.580	2,576	2,628	2,519	2,461	2,408	2,408
Georgina	2,228	2,245	2,245	2,232	2,116	2,116	2 082	1,948	1,823	1,714	1,738	1,718	1,676
Gwillimbury, E.	3,349	3,620	3,725	3,892	3,639	3,814	3,836	3,800	3,516	3,328	3,449	3,355	3 240
Gwillimbury, N.	1,770	1 815	1,823	1,953	1.770	1,718	1,624	1,447	1,903	1,930	1,947	1 963	1,968
King	5,379	5 770	5,623	5,655	5,417	5,601	5,815	5,612	5,672	5.554	5,605	5.865	5 614
Markham	5,529	5,146	5,355	5,600	5,388	5,536	5,466	5 674	5,811	5,416	5 496	5.573	6.635
Scarborough	3,769	3,721	3,896	4,082	3,753	4.104	4,236	4.180	4,036	3,979	4,030	4,077	4,096
Vaughan	5,302	5.417	4,966	5,230	5,515	5,625	5,539	5.475	5,501	5.038	5 445	5,387	5 410
Whitchurch	4,065	3,972	4.119	4,117	4,048	4,148	4.093	3,973	3.964	4 033	4 034	3,965	3 835
York	7,689	10.374	10,319	10,939	11,153	10,981	11,298	10,365	9 976	8.91	8,628	8.114	7,114
Rural	41,724	44.935	44,858	46,428	45,493	46,258	46,509	45,056	44,330	41,476	42,833	42,429	41,996

TABLE No. XXXVIII.—POPULATION.—*Continued.*

MUNICIPALITIES.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876	1875.	1874.	1873.	1872.
YORK.—*Continued.*													
Newmarket	1,747	1,712	1,704	1,704	1,698	1,786	1,697	1,906	1,829	1,777	1,662	1,424	1,424
Aurora	1,685	1,547	1,456	1,480	1,344	1,381	1,146	1,203	1,275	1,114	1,163	1,095	1,201
Brockton	.....	849	713	702	.....	.....	.....	.....	.....	.....	.....	.....	.....
Holland Landing	485	481	536	553	616	584	542	508	555	534	521	537	569
Markham	999	1,033	937	949	919	889	895	872	886	861	868	862	.....
Parkdale	2,588	2,110	1,854	1,183	897	776	.....	.....	.....	.....	.....	.....	.....
Richmond Hill	862	755	798	797	749	699	681	659	662	608	656	631	.....
Stouffville	863	871	841	805	863	755	754	718	.....	.....	.....	.....	.....
Weston	928	962	800	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Woodbridge	978	923	872	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Yorkville	.....	.....	5,211	5,056	4,899	4,739	4,371	4,202	3,995	3,872	3,367	2,766	5,285
Urban	11,135	11,243	15,722	13,229	11,985	11,609	10,086	10,068	9 202	8,766	8,237	7,315	5,479
Total	52,859	56,178	60,580	59,657	57,478	57,867	56,655	55,118	54,032	51,242	51,070	49,744	47,475
ONTARIO:													
Brock	4,133	4,150	4,139	4,156	4,174	4,140	5,130	4,931	4,931	4,808	4,274	4,685	4,685
Mara	2,893	2,856	2,767	2,940	2,833	2,744	2,728	2,603	2,624	2,624	2,259	2,259	2 218
Pickering	6,620	6,204	6,368	6,035	6,123	6,109	6,209	6,001	5,840	5,840	6,373	6,373	6,525
Rama	1,045	967	942	913	977	995	970	822	717	717	613	595	577
Reach	4,487	4,588	4,385	4,385	4,335	4,535	4,503	4,324	4,138	4,138	4,529	4,812	4,812
Scott	2,184	2,184	2,186	2,414	2,480	2,493	2,562	2,554	2,563	2,563	2,557	2,557	2,557
Seugog	585	600	639	625	553	591	653	627	676	676	610	610	630
Thorah	2,239	2,178	2,118	2,420	2,283	2,136	1,963	2,046	2,172	2,185	2,061	2,061	1,992
Uxbridge	3,677	3,641	3,686	3,748	3,863	3,656	3,836	3,781	3,855	3,855	3,709	3,707	4,186
Whitby, E	3,121	2,998	3,456	3 267	3,220	3,284	3,205	3,366	3,340	3,398	3,314	3,314	3,309
Whitby	2,589	2,697	2,790	2 852	2,815	2,783	2,884	2,769	2,739	2,739	2,967	2,967	2,950
Rural	33,474	32,973	33,576	33,755	33,656	33,466	34,643	33,824	33,595	33,543	33,266	33,940	34,441
Oshawa	4,379	4,409	4,177	4,196	4,352	4,475	4,548	4,180	4,206	4,206	3,775	3,775	2,805
Whitby	2,984	2,708	2,969	2,946	3,349	3,397	3,412	3,346	3,211	3,211	3,012	3,012	2,963
Cannington	962	951	917	903	919	887	.....	.....	.....	.....	.....	.....	.....
Port Perry	1,765	1,765	1,773	1,687	1,753	1,869	1,948	1,899	1,558	1,558	1,462	1,462	.....
Uxbridge	1,839	1,830	1,781	1,674	1,608	1 616	1,655	1,655	1,600	1,188	1,032	1,032	.....
Urban	11,929	11,663	11,617	11,406	11,981	12,244	11,563	11,080	10,575	10,163	9,281	9,281	5,768
Total	45,403	44,636	45,193	45,161	45,637	45,710	46,206	44,904	44,170	43,706	42,547	43,221	40,209
DURHAM:													
Cartwright	2,070	2,054	2,218	2,255	2,014	1,978	2,060	2,065	2,210	2,300	2,605	2,565	1,830
Cavan	3,282	3,287	3,128	3,213	3,249	4,452	4,571	4,405	4,404	4,389	4,280	4,258	4,398
Clarke	4,608	4,391	4,892	5,096	4,767	4,445	4,547	4,494	4,532	4,500	4,500	4,576	4,576
Darlington	4,780	4,782	4,968	5,044	5,170	4,990	5,312	5,472	5,552	4,804	5,741	5,798	5,536
Hope	4,054	4,012	3,997	3,946	3,710	3,813	3,740	3,548	3,544	3,679	3,500	3,406	3,447
Manvers	3,320	3,320	3,412	3,319	3,139	2,954	3,129	3,277	3,228	3,413	3,415	3,269	3,165
Rural	22,114	21,846	22,615	22,873	22 049	22,632	23,359	23,261	23,470	23,085	24,041	23,872	22,952
Bowmanville	3,695	3,618	3,567	3,462	3,255	3,237	3,155	3,243	3,285	3,367	3,300	3,270	3,199
Port Hope	5,455	5,513	5,440	5,382	5,324	5,546	5,515	5,974	5,974	5,991	5,677	5,445	5,352
Millbrook	1,043	1,038	1,084	1,062	1,119	.....	.....	.....	.....	.....	.....	.....	.....
Newcastle	872	848	943	1,038	1,038	1,180	1,167	1,148	1,145	954	1,003	871	871
Urban	11,065	11,017	11,034	10,944	10,736	9,963	9,837	10,365	10,404	10,312	9,980	9,586	9,422
Total	33,179	32,863	33,649	33,817	32,785	32,595	33,196	33,626	33,874	33,397	34,021	33,458	32,374
NORTHUMBERLAND:													
Alnwick	1,080	1,063	1,083	1,220	1,016	980	1,107	1,055	1,036	1,009	976	945	968
Brighton	2,793	2,856	2,854	2,849	2,821	2,890	2,753	3,145	2,935	2,797	3,003	2,980	2,938
Cramahe	3,031	2,925	3,114	3,181	3,080	3,147	2,800	3,000	2,908	2,861	2,970	2,938	2,952
Haldimand	4,537	4,586	5,087	5,185	5,185	4,527	4,527	4,797	4,683	4,510	4,627	4,891	4,410
Hamilton	4,178	4,277	4,596	4,649	4,397	4,481	4,834	4,913	5,118	4,976	5,194	5,270	5,345
Monaghan, S.	993	871	900	1,072	1,077	924	959	1,028	990	978	897	943	914
Murray	2,973	2,965	3,182	3,070	3,166	3,063	3,081	3,090	3,004	3,069	2,732	2,863	3,075
Percy	3,186	3,154	3,419	3,529	3,321	3,263	3,168	3,101	3,025	3,128	2,878	3,196	3,275
Seymour	3,304	3,263	3,476	3,293	3,358	3,411	3,276	3,405	3,219	4,189	4,047	4,200	3,832
Rural	26,075	25,960	27,711	28,048	27,421	26,686	26,505	27,534	26,918	27,517	27,324	28,166	27,709
Cobourg	5,100	5,313	5,210	5,164	5,118	5,178	5,177	5,278	5,019	4,893	4,694	4,694	4,170
Brighton	1,498	1,501	1,481	1,515	1,550	1,557	1,586	1,545	1,488	1,398	1,390	1,192	1,192
Campbellford	1,714	1,693	1,602	1,355	1,292	1,060	1,080	1,144	959	.....	.....	.....	.....

TABLE No. XXXVIII.—POPULATION.—*Continued*

MUNICIPALITIES.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
NORTHUMBERLAND—*Con.*													
Colborne	915	953	939	974	1,009	1,029	935	1,036	973	882	878	794	894
Hastings	793	803	806	802	778	725	735	772	772	799	922	.....	.....
Urban	10,020	10,263	10,038	9,810	9,747	9,549	9,513	9,775	9,206	7,972	7,884	6,680	6,256
Total	36,095	36,223	37,749	37,858	37,168	36,235	36,018	37,309	36,124	35,489	35,208	34,846	33,965
PRINCE EDWARD:													
Ameliasburg	3,071	3,020	2,995	3,084	3,106	3,004	3,012	3,167	3,238	3,180	2,829	3,031	3,169
Athol	1,340	1,331	1,331	1,384	1,446	1,408	1,280	1,321	1,305	1,275	1,375	1,390	1,334
Hallowell	3,117	3,117	3,124	3,217	3,342	3,446	3,515	3,463	3,310	3,310	2,930	3,105	3,487
Hillier	1,735	1,957	1,791	1,842	1,921	1,985	1,954	2,075	1,897	1,700	1,810	1,919	1,919
Marysburgh, N.	1,531	1,578	1,443	1,548	1,541	1,530	1,506	1,443	1,375	1,446	1,287	1,427	1,467
Marysburgh, S.	1,949	1,947	1,953	1,886	1,944	1,927	1,836	1,970	1,838	1,868	1,872	1,501	1,539
Sophiasburgh	2,211	2,239	2,108	2,200	2,085	2,173	2,128	2,150	2,121	2,078	2,027	2,001	2,246
Rural	15,004	15,189	14,745	15,161	15,385	15,473	15,231	15,589	15,084	14,857	14,130	14,434	15,161
Picton	2,975	2,733	2,863	2,833	2,828	2,855	2,869	2,842	2,607	2,443	2,438	2,213	2,391
Wellington	508	503	523	537	550	543	484	502	528	487	499	442	494
Urban	3,483	3,236	3,386	3,370	3,378	3,398	3,353	3,344	3,135	2,930	2,937	2,655	2,885
Total	18,487	18,425	18,131	18,531	18,763	18,871	18,584	18,933	18,219	17,787	17,067	17,089	18,046
LENNOX AND ADDINGTON:													
Adolphustown	664	685	620	649	679	632	734	641	668	563	634	604	665
Amherst Island	1,058	1,067	1,093	1,117	1,141	1,074	1,140	1,091	1,056	1,072	973	1,052	1,073
Camden, East	4,464	4,174	4,040	4,142	4,243	4,678	4,433	4,133	4,430	4,568	4,420	4,188	4,230
Denbigh, Abinger and Ashby	647	552	552	536	520	572	400	377	370	353	357	347	324
Ernesttown	3,264	3,288	3,243	3,354	3,464	3,439	3,511	3,638	3,476	3,572	3,698	3,692	3,694
Fredericksburg, N.	1,540	1,480	1,640	1,583	1,526	1,592	1,531	1,475	1,433	1,473	1,401	1,374	1,377
Fredericksburg, S.	1,245	1,067	1,250	1,195	1,139	1,264	963	1,094	1,003	1,215	1,004	1,177	1,139
Kaladar and Anglesea	935	904	932	895	858	858	875	796	797	669	718	652	589
Richmond	2,590	2,518	2,676	2,477	2,278	2,550	2,620	2,868	2,731	2,678	2,747	2,678	2,731
Sheffield	2,178	2,225	2,218	2,243	2,267	2,247	2,377	2,144	2,419	1,590	1,590	2,184	2,034
Rural	18,585	17,960	18,264	18,191	18,115	18,906	18,584	18,257	18,383	17,753	17,542	17,948	17,856
Napanee	3,062	3,558	3,323	3,313	3,302	3,101	2,894	3,127	3,451	3,364	3,251	3,026	2,757
Bath	525	621	637	589	542	550	520	526	532	602	528	526	527
Newburgh	711	791	797	760	723	700	716	665	680	779	817	700	644
Urban	4,298	4,970	4,757	4,662	4,567	4,351	4,130	4,318	4,663	4,745	4,596	4,252	3,928
Total	22,883	22,930	25,021	22,853	22,682	23,257	22,714	22,575	22,046	22,498	22,138	22,200	21,784
FRONTENAC:													
Barrie	476	433	458	419	380	395	364	329	326	330	363	318	331
Bedford	1,337	1,327	1,560	1,568	1,577	1,604	1,635	1,567	1,603	1,535	1,488	1,565	1,510
Clarendon	572	699	660	642	624	680	640	495	476	442	290	408	345
Miller	124												
Hinchinbrooke	1,167	1,105	1,101	1,155	1,209	1,181	997	924	1,070	895	881	948	861
Howe Island	398	384	400	396	391	384	364	373	437	437	466	462	419
Kennebec	1,071	885	966	935	904	919	955	818	762	526	687	631	696
Kingston	3,047	2,750	2,418	2,716	3,014	2,976	2,721	2,700	3,213	2,717	2,983	2,768	2,795
Loughboro	1,498	1,849	1,904	1,855	1,807	2,124	2 060	1,909	1,852	1,852	2,161	1,980	2,585
Olden	881	877	715	728	741	792	732	677	637	614	547	525	533
Oso	796	938	767	779	791	783	671	800	608	580	505	467	468
Palmerston and Canonto	712	732	728	739	750	714	893	1,013	690	577	546	600	372
Pittsburgh	2,601	2,643	2,653	2,760	2,867	2,928	2,867	3,078	3,057	2,976	2,982	3,015	2,902
Portland	2,249	2,286	2,303	2,300	2,296	2,231	2,254	2,098	2,232	2,353	1,991	2,158	2,043
Storrington	2,062	2,086	2,200	2,217	2,234	2,246	2 239	2,080	2,233	2,279	2,642	2,576	2,600
Wolfe Island	1,789	1,916	1,955	1,917	1,880	1,999	2,105	1,985	1,923	2,393	2,275	2,275	2,181
Rural	20,780	20,910	20,788	21,126	21,465	21,956	21,497	20,846	21,119	20,506	20,807	20,696	20,641
Garden Island	457	760	493	502	511	577	489	668	629	663	697	669	727
Portsmouth	924	807	1,066	999	932	861	865	874	946	932	926	980	1,112
Urban	1.381	1,567	1,559	1,501	1,443	1,438	1,354	1,542	1,575	1,595	1,623	1,649	1.839
Total	22,161	22,477	22,347	22,627	22,908	23,394	22,851	22,388	22,694	22.101	22,430	22,345	22.480

TABLE No. XXXVIII.—POPULATION.—*Continued.*

MUNICIPALITIES.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
LEEDS AND GRENVILLE:													
Augusta	4,601	4,552	4,525	4,418	4,483	4,709	4,732	4,669	4,475	4,406	4,475	4,357	4,150
Bastard and Burgess, S	2,900	2,816	2,810	2,665	2,476	2,679	2,986	2,831	2,831	2,854	2,992	3,020	2,915
Crosby, N.	1,672	1,624	1,633	1,630	1,693	1,706	1,715	1,713	1,695	1,775	1,687	1,750	1,665
Crosby, S.	1,668	1,683	1,816	1,865	1,834	1,938	1,915	1,915	1,905	1,890	1,931	1,859	1,870
Edwardsburg	4,050	4,221	4,182	4,143	4,145	4,732	4,715	4,718	4,481	4,471	4,418	4,372	4,367
Elizabethtown	4,166	4,166	4,201	4,214	4,471	4,320	4,320	4,183	4,008	4,187	4,000	4,161	4,042
Elmsley, S.	819	788	930	960	967	935	961	1,012	1,009	926	906	955	1,073
Escott, Front	1,144	1,163	1,228	1,034	1,034	1,200	1,218	1,218	1,385	1,190	1,168	1,197	1,101
Gower, S.	888	882	921	842	884	944	925	867	910	927	922	895	903
Kitley	2,065	2,038	2,219	2,261	2,325	2,275	2,332	2,345	2,419	2,404	2,315	2,329	2,451
Leeds & Lansdowne, F	3,008	3,032	2,919	3,028	3,125	3 150	3,003	3,066	3,180	3,045	3,068	2,852	2,892
Leeds & Lansdowne, R	2,176	2,239	2,199	2,401	2,286	2,286	2,428	2,306	2,351	2,251	2,115	2,196	2,213
Oxford on Rideau	3,040	3,085	3,139	3,118	3,333	3,390	3,484	3,433	3,449	3,294	3,348	3,320	3,366
Wolford	1,915	1,905	1,877	1,900	1,945	1,984	1,984	2,044	2,016	2,073	2,019	2,023	2,189
Yonge, F.	1,408	1,561	1,547	1,493	1 652	1,502	1,540	1,549	1,420	1,464	1,460	1,543	1,412
Yonge and Escott, R.	1,940	1,961	1,937	1,985	2,100	2,102	2,088	1,967	1,920	1,950	1,939	1,662	1,948
Rural	37,460	37,685	38,083	38,007	38,752	39,352	40,346	39,923	39,454	39,107	38,763	38,497	38,257
Brockville	8,499	7,929	7,504	7,473	7,441	7,468	6,597	6,543	6,496	6,170	5,916	5,409	5,409
Prescott	2,842	2,842	2,893	2,930	2,968	2,872	2,693	2,747	2,879	2,717	2,694	2,634	2,574
Cardinal	598	595	605	546	800	.....	.....	.....	.....	.....	.....	.....	.....
Gananoque	3,079	2,919	3,007	2,736	2,781	2,856	2,812	2,812	2 808	2,898	2,813	2,662	2,377
Kemptville	1,169	960	899	987	1,136	1,140	1,125	1,119	1,018	945	822	859	767
Merrickville	753	675	726	719	781	819	849	884	894	849	858	823	701
Newboro	431	500	423	387	459	400	419	435	393	.....	.....	.....	.....
Urban	17,371	16,420	16,057	15,778	16,366	15,564	14,495	14,540	14,575	13,579	13,103	12,407	11,828
Total	54,831	54,105	54,140	53,785	55,118	55,416	54,841	54,463	54,029	52,686	51,866	50,898	50,085
DUNDAS:													
Matilda	4,013	3,950	3,728	3,785	3,841	3,840	4,026	4,000	3,361	3,910	3,591	3,821	3,821
Mountain	2,976	3,024	3,070	3,098	3,033	3,094	3,104	3,151	2,953	2 368	3,014	2,705	2,727
Williamsburg	3,936	4,051	4,022	4,186	3,956	4,069	3,828	4,200	3,900	3,845	3,835	3,933	3,864
Winchester	4,086	4,449	4,058	4,032	3,838	3,923	3,864	3,727	3,640	3,676	3,726	3,481	3,680
Rural	15,011	15,474	14,878	15,101	14,668	14,926	14,822	15,078	13,854	13,799	14,166	13,940	14,092
Iroquois	996	969	964	902	872	918	945	900	649	572	550	522	653
Morrisburgh	2,000	1,681	1,708	1,704	1,797	1,806	1,531	1,558	1,621	1,619	1,395	1,216	967
Urban	2,996	2,650	2,672	2,606	2,669	2,724	2,476	2,458	2,270	2,191	1,945	1,738	1,620
Total	18,007	18,124	17,550	17,707	17,337	17,650	17,298	17,536	16,124	15,990	16,111	15,678	15,712
STORMONT:													
Cornwall	3,770	3,745	3,583	3,580	3,510	3,381	3,448	3,603	3,510	3,600	3,300	3,980	3,656
Finch	2,929	3,086	2,640	3,035	2,879	2,886	3,048	2,881	2,675	2,700	2,805	2,736	2,697
Osnabruck	4,894	4,946	4,880	4,856	4,790	4,880	4,674	4,674	5,380	5,068	5,068	5,088	4,950
Roxborough	3,712	3,712	3,822	3,727	3,712	3,763	3,508	3,384	3,427	3,044	3,191	3,118	3,063
Rural	15,285	15,489	14,925	15,198	14,891	14,910	14,678	14,542	14,992	14,412	14,367	14 922	14,366
Cornwall....(Urban).	5,391	4,932	4,316	4,190	4,154	3,867	5,652	3,459	3,093	3,517	3,335	3,060	3,577
Total	20,676	20,421	19,241	19,388	19,045	18,777	18,330	18,001	18,085	17,929	17,702	17,982	17,943
GLENGARRY:													
Charlottenburgh	5,087	5,237	5,228	5 473	5,474	5 867	5,689	5,744	4,762	4,790	4,484	4,264	4,173
Kenyon	4,062	4,873	4,593	4,278	4 171	4,096	4,477	4,320	4,535	4,319	4,103	4,363	4,258
Lancaster	4,149	3,877	4,045	4,164	4,082	4,187	4,000	4 000	4,597	3,842	3,825	3,594	3,685
Lochiel	3,843	4,820	4,674	4,480	4,500	4,500	4,368	4,368	3,645	3,686	3,701	3,620	3,750
Rural	17,741	18,807	18,540	18,395	18,227	18,590	18,534	18,432	17,539	16,637	16,113	15,841	15,866
Alexandria..(Urban).	1,200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	18,941	18,807	18,540	18,395	18,227	18,590	18,534	18,432	17,539	16,637	16,113	15,841	15,866
PRESCOTT:													
Alfred	2,812	3,146	2,503	2,454	2,209	2,263	2,022	1,821	1,799	1,800	1,796	2,172	1,730
Caledonia	1,509	1,528	1,502	1,440	1,429	1,369	1,297	1,269	1,238	1,166	869	860	958
Hawkesbury, E.	3,711	3,817	3,796	3,898	4,001	3,733	3,677	3,431	4,205	4,006	4,265	4,260	4,067
Hawkesbury, W.	1,937	1,739	1,796	1,888	1,965	1,990	2,003	1,960	1,964	1,352	1,422	1,492	1,255
Longueuil	1,069	1,107	972	984	997	1,063	907	883	1,136	1,503	1,345	1,477	1,294

TABLE No. XXXVIII.—POPULATION.—*Continued.*

MUNICIPALITIES.	1884.	1883	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
PRESCOTT.—*continued.*													
Plantagenet, N.	3,653	3,691	3,602	3,446	3,500	3,612	3,407	3,171	2,924	2,668	2,910	2,903	2,903
Plantagenet, S.	2,568	2,217	2,217	2,192	2,159	2,076	2,012	1,931	1,740	1,779	1,491	1,356	1,356
Rural	17,259	17,245	16,388	16,302	16,260	16,046	15,325	14,406	15,006	14,666	14,089	14,529	13,563
Hawkesbury	1,469	1,462	1,344	1,457	1,452	1,481	1,582	1,650	1,277	1,342	1,300	1,257	1,426
L'Orignal	801	801	801	764	736	685	639	639	639	.....	.....	.....	.....
Urban	2,270	2,263	2,145	2,221	2,188	2,166	2,221	2,289	1,916	1,342	1,300	1,257	1,426
Total	19,529	19,508	18,533	18,523	18,448	18,212	17,546	16,695	16,922	16,008	15,389	15,777	14,989
RUSSELL:													
Cambridge	1,791	1,680	1,613	1,471	1,339	1,400	1,228	1,205	1,173	986	867	755	1,140
Clarence	4,325	4,477	4,297	4,059	3,889	3,882	3,592	3,717	3,773	3,105	3,083	2,872	2,560
Cumberland	3,490	3,485	2,642	2,509	2,506	2,650	2,721	2,708	2,622	2,597	2,629	2,850	2,737
Russell	3,029	3,029	2,813	2,833	2,786	2,669	2,788	2,748	2,748	2,620	2,467	2,314	2,342
Total (Rural).	12,135	12,671	11,365	10,872	10,520	10,601	10,329	10,378	10,316	9,302	9,046	8,791	8,779
CARLETON:													
Fitzroy	2,621	2,437	2,651	2,798	2,448	2,656	2,440	2,500	2,725	3,042	2,408	1,5[illegible]	1,733
Gloucester	5,000	4,666	4,764	5,0[illegible]	5,150	5,150	5,000	5,000	4,421	4,320	4,002	4,002	3,843
Goulbourn	2,817	2,643	2,911	3,235	3,200	3,340	3,090	3,040	2,682	2,521	2,762	2,415	2,620
Gower, N.	1,939	1,959	2,394	2,388	2,266	2,149	2,302	2,283	2,275	2,345	2,209	2,206	2,206
Huntley	2,307	2,312	2,326	2,393	2,457	2,481	2,438	2,466	2,325	2,367	2,329	2,364	2,351
March	1,035	1,048	1,163	1,122	1,038	1,042	1,042	1,053	1,029	1,069	974	946	972
Marlborough	1,777	1,723	1,855	1,852	1,861	2,110	1,991	2,000	1,500	1,414	1,994	1,500	2,071
Nepean	7,406	7,019	6,994	7,058	6,776	7,002	7,031	6,500	6,507	5,778	5,281	4,726	4,345
Osgoode	4,263	3,837	3,995	3,995	3,799	3,921	3,885	3,685	3,570	3,199	3,716	3,800	3,675
Torbolton	811	811	868	1,118	926	920	888	845	801	757	741	620	620
Rural	29,976	28,435	29,921	30,959	29,921	30,771	30,107	29,372	27,835	26,812	26,416	24,085	24,436
New Edinburgh	1,057	1,066	905	867	897	894	890	907	944	826	757	693	588
Richmond	441	430	347	381	364	377	452	477	370	332	392	395	388
Urban	1,498	1,496	1,252	1,248	1,261	1,271	1,342	1,384	1,314	1,158	1,149	1,088	976
Total	31,474	29,931	31,173	32,207	31,182	32,042	31,449	30,756	29,149	27,970	27,565	25,173	25,412
RENFREW:													
Admaston	2,134	2,152	2,201	2,126	2,225	2,228	2,054	2,103	2,077	2,129	2,079	2,000	1,786
Algona, S.	679	633	621	662	604	529	498	503	463	700	412	527	642
Alice and Fraser	1,561	1,569	1,552	1,607	1,441	1,557	1,504	1,517	1,525	1,471	1,492	1,340	1,344
Bagot and Blithefield.	962	900	962	952	1,027	1,062	1,034	1,072	1,039	1,008	842	1,001	1,169
Bromley	1,569	1,539	1,623	1,623	1,646	1,577	1,630	1,588	1,531	1,540	1,403	1,344	1,317
Brougham	650	620	575	490	530	612	420	300	678	369	425	460	500
Brudenell & Lyndoch.	1,165	1,149	1,038	1,185	1,162	1,213	1,470	1,457	1,237	1,283	1,073	1,086	931
Grattan	1,605	1,494	1,510	1,523	1,488	1,412	1,466	1,694	1,461	1,640	1,332	1,260	1,388
Griffith and Matawatchan	589	532	516	569	570	553	560	500	484	474	527	273	273
Hagarty, Jones, Sherwood, Richard and Burns	1,264	1,361	1,392	1,210	1,365	1,281	1,280	1,200	.....	.....	.....	.....	.....
Head, Clara and Maria.	308	308	270	391	330	269	282	150	175	175	170	140	140
Horton	1,345	1,277	1,252	1,262	1,304	1,226	1,217	1,173	1,089	1,043	855	1,074	1,066
McNab	3,166	3,047	3,066	2,984	2,927	2,877	2,725	2,852	2,861	3,031	2,636	2,732	2,608
Pembroke	654	635	621	630	584	552	589	563	531	646	536	470	466
Petewawa and McKay	425	423	472	547	587	593	545	553	553	512	409	446	362
Radcliffe and Raglan	659	636	619	619	660	711	.....	.....	.....	.....	.....	.....	.....
Rolph, Wylie and Buchanan	882	519	525	577	538	530	574	493	506	414	418	405	421
Ross	2,123	2,269	2,213	2,080	1,697	1,423	1,778	1,817	1,722	1,690	1,575	1,570	1,545
Sebastopol	562	553	537	572	537	549	536	502	550	477	457	510	544
Stafford	953	1,014	951	973	987	966	915	784	885	840	752	688	701
Westmeath	2,648	2,581	2,627	2,614	2,608	2,546	2,737	2,597	2,605	2,479	2,361	2,410	2,273
Wilberforce and Algona, N.	1,965	1,970	1,883	2,002	2,003	2,115	2,027	2,175	1,949	2,083	2,039	1,982	1,674
Rural	27,898	27,161	26,966	27,198	26,821	26,355	25,835	25,593	23,911	24,004	21,793	21,718	21,150
Pembroke	3,272	3,286	3,000	2,804	2,886	2,824	2,805	2,741	2,298	2,630	2,675	2,356	1,895

TABLE No. XXXVIII.—POPULATION.—*Continued.*

MUNICIPALITIES.	1884.	1883	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
RENFREW.—*Continued.*													
Arnprior	3,000	2,860	2,000	1,948	1,844	1,769	1,820	1,639	1,433	1,874	1,993	2,202	1,710
Renfrew	1,985	1,329	1,414	1,483	1,282	1,199	1,112	1,306	1,542	1,250	1,138	1,125	858
Urban	8,257	7,415	6,414	6,235	6,012	5,792	5,797	5,686	5,273	5,734	5,806	5,683	4,443
Total	36,065	34,576	33,380	33,433	32,833	32,147	31,632	31,279	29,184	29,758	27,599	27,401	25,593
LANARK:													
Bathurst	2,555	2,587	2,617	2,677	2,736	2,806	2,830	2,828	2,816	2 846	2,669	2,491	2,803
Beckwith	1,659	1,663	1,750	1,791	1,832	1,849	1,794	2,035	2,077	2,080	2,067	2,055	1,617
Burgess, N.	936	1,035	1,058	1,034	1,010	1,154	1,190	1,181	1,095	1,102	1,112	1,122	1,162
Dalhousie and Sherbrooke, N.	2,050	2,689	2,471	2,458	2,444	2,391	2,438	2,416	2,410	2,398	2,352	2,307	2,307
Lavant	556												
Darling	620	651	647	694	742	702	677	690	687	709	728	746	724
Drummond	2,134	2,094	2,137	2,188	2,240	2,134	2,168	2,058	1,999	1,983	2,073	2,163	1,685
Elmsley, N.	1,109	1,112	1,141	1,130	1,118	1,156	1,138	1,152	1,662	1,455	1,377	1,300	1,310
Lanark	1,639	1,752	1,717	1,747	1,777	1,832	1,835	1,834	1,895	1,864	1,903	1,942	1,942
Montague	2 090	2,240	2,126	2,158	2,190	2,156	2,166	2,068	2,245	2,431	2,480	2,528	2,528
Pakenham	1,801	1,866	1,804	1,792	1,780	1,773	1,730	1,780	1,791	1,775	1,756	1,736	1,759
Ramsay	2,365	2,416	2,203	2,377	2,550	2,546	2,538	2,546	2,408	2,352	2,257	2,163	2,347
Sherbrooke, S.	849	841	742	782	823	834	796	758	559	744	739	734	642
Rural	20,363	20,946	20,413	20,828	21,242	21,333	21,300	21,346	21,554	21,739	21,513	21,287	20,826
Almonte	2,842	2,906	2,632	2,631	2,633	2,516	2,529	2,570	2,670	2,163	2,395	2,627	1,797
Perth	3,780	3,202	2,730	2,755	2,780	2,803	2,845	2,745	2,538	2,899	2,914	2,930	2,853
Smith's Falls	2,086	2,009	2,003	1,980	1,957	1,804	1,800	1,853	1,777	1,969	1,732	1,494	1,382
Carleton Place	2,707	2,452	1,915	1,800	1,688	1,669	1,834	1,873	1,815	1,651	1,671	1,690	1,041
Lanark	705	687	689	666	642	705	654	678	627	640	626	633	633
Urban	12,120	11,256	9,969	9,832	9,700	9,497	9,662	9,719	9,427	9,322	9,348	9,374	7,706
Total	32,483	32,202	30,382	30,660	30,942	30,830	30,962	31,065	30,981	31,061	30,861	30,661	28,532
VICTORIA:													
Bexley	677	640	711	844	659	692	677	559	546	613	533	431	431
Carden	766	1,130	786	995	1,203	1,051	1,191	1,346	1,160	1,138	1,004	860	966
Dalton	374		416										
Eldon	2,858	3,111	2,888	3,008	3,296	3,238	3,005	3,079	2,929	2,929	2,760	2,441	2,441
Emily	2,366	2,366	2,434	2,382	2,554	2,489	2,529	2,470	2,617	2,657	2,711	3,175	3,175
Fenelon	2,652	2,784	2,806	2,811	2,733	2,722	2,652	2,842	2,690	2,759	3,756	3,441	3,528
Laxton, Digby and Longford	809	771	801	793	794	789	771	758	787	728	713	731	762
Mariposa	4,719	5,397	5,397	5,216	4,910	4,795	4,809	4,981	4,451	4,782	5,006	5,228	5,002
Ops	2,861	2,850	2,766	2,804	2,781	2,895	2,856	3,077	3,021	3,058	3,666	3,123	3,148
Somerville	1,251	1,251	1,187	1,359	1,282	1,432	1,342	1,173	1,117	1,087	1,033	939	887
Verulam	2,041	2,041	2,161	2,195	2,230	2,009	2,109	2,112	2,522	2,516	2,273	2,325	2,325
Rural	21,374	22,341	22,353	22,410	22,442	22,112	21,941	22,397	21,840	22,267	23,455	22,694	22,665
Lindsay	5,388	5,251	5,120	5,365	5,324	5,521	5,591	5,374	5,353	5,382	4,678	4,076	4.076
Bobcaygeon	811	872	713	710	717	669	752	714	.....	.....	.....	.....	.....
Fenelon Falls	1,208	1,144	1,050	1,017	965	921	1,038	957	1,073	1,251	.....	.....	.....
Omemee	713	665	650	689	774	821	855	803	797	790	834	.....	.....
Woodville	474	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Urban	8.594	7,932	7,533	7,781	7,780	7,932	8,216	7,848	7,222	7,423	5,512	4,076	4,076
Total	29,968	30,273	29,886	30,191	30,222	30,044	30,157	30.245	29,062	29,690	28,967	26.770	26.741
PETERBOROUGH:													
Asphodel	1,813	1,761	1,741	1,687	1,792	1,846	1,958	2,629	2,563	2,425	2,752	3,080	3,080
Belmont and Methuen	1,639	1,632	1,580	1,643	1,740	1,626	1,652	1,553	1,553	1,639	1,610	1,737	1,451
Burleigh	265	280											
Anstruther	186	197	1,279	1,307	1,296	1,070	1,084	941	835	837	724	724	649
Chandos	803	818											
Douro	1,982	1,889	1,926	1,862	2,146	2,129	1,923	1,654	1,857	1,834	2,381	2,159	2,145
Dummer	1,987	1,951	1,936	2,012	1,980	1,839	1,777	1,759	1,839	1,728	1,713	1,802	1,821
Ennismore	969	980	1,002	1,033	1,077	1 023	884	1,038	1,062	831	920	892	867
Galway and Cavendish	719	655	648	716	692	534	574	501	458	465	507	498	498
Harvey	979	964	954	934	979	1,021	932	947	798	817	756	706	631
Monaghan, N.	792	750	743	740	742	771	879	837	844	752	764	736	1,152
Otonabee	3,741	3,661	3,607	3,739	3,766	3,685	3,525	3,480	3,542	3,385	3,445	3,277	5,299
Smith	2,749	2,714	2,729	2,732	2,772	2,777	2,734	2,732	2,772	2,714	2,906	2,802	3 179
Rural	18,624	18,252	18,145	18,405	18,382	18,321	17,913	18 071	18,103	17,427	18 478	18,413	18,763

TABLE No. XXXVIII.—POPULATION.—*Continued.*

MUNICIPALITIES.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
PETERBOROUGH.—*Con.*													
Peterborough	7,622	7,832	7,010	6,752	6,495	6,606	6,825	6,875	6,814	7,055	6,812	5,717	5,717
Ashburnham	1,308	1,308	1,292	1,299	1,205	1,251	1,245	1,296	1,306	1,227	1,284	1,301	1,129
Lakefield	1,087	996	981	987	976	911	816	902	893	893	.....	.....	.....
Norwood	747	756	760	767	750	813	821	.....	.....	.....	.....	.....	.....
Urban	10,764	10,892	10,043	9,805	9,426	9,581	9,707	9,073	9,013	9,175	8,096	7,018	6,846
Total	29,388	29,144	28,188	28,210	28,408	27,902	27,620	27,144	27,116	26,602	26,574	25,431	25,609
HALIBURTON:													
Lutterworth	483	379	488	491	515	525	582						
Anson and	207	179	329	322	342	342	237	900	990	616	480	345	311
Hindon	49	73											
Cardiff	486	502	499	515	483	389	339						
Glamorgan	491	496	486	864	789	695	583	698	550	242	148	54	.....
Monmouth	363	377	397										
Minden	1,045	1,052	1,019	1,075	1,148	993	1,099	1,090	1,081	1,045	973	901	851
Snowdon	695	730	848	540	540	722	599	537	475	425	399	372	385
Stanhope, Sherborne	590	423	479	495	486	473	463	417	372	310	292	274	274
Clyde, Burton, Dudley, Dysart, Eyre, Guilford, Havelock, Harcourt and Harburn	965	876	891	914	1,013	926	861	858	856	856	814	772	739
Total.... (Rural)	5,374	5,087	5,436	5,216	5,316	5,065	4,763	4,500	4,324	3,494	3,106	2,718	2,560
HASTINGS:													
Carlow and Mayo	947	714	814	869	925	939	814	725	628	493	478	576	640
Elzevir and Grimsthorpe	1,213	1,130	1,115	1,132	1,150	1,208	1,199	1,111	1,234	1,245	1,130	1,198	1,266
Faraday and Dungannon	1,002	950	936	920	904	853	690	572	528	475	483	418	390
Hungerford	3,820	3,782	3,810	4,005	4,200	4,465	4,500	4,540	4,375	4,350	4,555	4,460	4,195
Huntingdon	2,222	2,187	2,345	2,377	2,408	2,674	2,624	2,750	2,800	2,775	2,770	2,655	2,593
McClure, Wicklow and Bangor	521	575	580	612	644	598	592	381	620	419			
Herschel and Monteagle	970	970	985	982	979	871	872	872	719	670	804	824	845
Madoc	2,653	2,675	2,823	2,700	2,576	2,516	2,473	2,858	2,668	2,645	2,900	2,188	2,509
Marmora and Lake	1,821	1,829	1,667	1,711	1,755	1,849	1,742	1,632	1,631	1,509	1,551	1,568	1,575
Rawdon	2,888	2,775	2,898	2,910	2,923	2,912	2,968	3,151	3,500	3,638	3,017	3,550	4,096
Sidney	3,922	3,566	3,465	3,698	3,930	3,812	3,667	3,774	3,963	4,024	3,851	3,714	3,780
Thurlow	4,429	4,328	4,271	4,392	4,513	4,530	4,500	4,400	5,000	4,800	4,500	4,500	4,340
Tudor, Cashel and Limerick	1,170	1,057	1,446	1,501	1,557	1,355	1,268	1,212	1,205	1,087	1,072	991	876
Wollaston	507	510											
Tyendinaga	4,317	4,373	4,910	4,759	4,609	4,647	4,556	4,781	4,473	4,344	4,761	4,712	4,885
Rural	32,402	31,421	32,065	32,568	33,073	33,229	32,465	32,759	33,344	32,474	31,872	31,354	31,990
Trenton	3,200	3,320	3,100	2,726	2,353	2,183	2,189	2,522	2,492	2,350	2,180	1,935	1,790
Deseronto	1,864	1,708	1,535	1,331	1,128	1,160	1,004	1,008	995	989	898	893	765
Madoc	1,557	1,193	1,049	1,063	1,077	865	658	.....	.....	.....	.....	.....	.....
Stirling	796	825	834	814	795	791	785	677	770	780	733	678	676
Urban	7,417	7,046	6,518	5,934	5,353	4,999	4,636	4,207	4,257	4,119	3,811	3,506	3,231
Total	39,819	38,467	38,583	38,502	38,426	38,228	37,101	36,966	37,601	36,593	35,683	34,860	35,221
MUSKOKA:													
Chaffey	999	1,041	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brunel	631	617	634	624	666	696	618	550	.....	.....	.....	.....	.....
Stephenson	823	807	877	863	920	962	848	766	566	737	726	755	546
Cardwell	380	268	243	246	316	190	196	803	705	620	719	687	678
Watt	795	757	750	755	757	747	758						
Draper	903	916	902	1,237	1,073	850	844	1,078	924	918	592	624	691
Oakley	303	275	261										
Ryde	635	617	607	623	525	516	441						
Macaulay	762	739	890	890	937	948	797	735	725	621	1,290	1,120	954
McLean and Ridout	610	704	695	700	677	721	571	571	417	341	266	.....	.....
Medora and Wood	736	705	664	675	627	612	498	464	340	429	467	302	302
Monck	554	613	576	621	680	625	548	520	478	530	581	457	150
Morrison	658	725	660	646	636	621	621	552	512	535	558	570	570
Muskoka	927	875	867	828	771	678	521	798	654	548	442	625	419
Stisted	642	628	624	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rural	10,358	10,287	9,256	8,708	8,585	8,166	7,261	6,837	5,321	5,279	5,581	5,140	4,310

TABLE No. XXXVIII.—POPULATION.—*Concluded.*

MUNICIPALITIES.	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
MUSKOKA.—*Continued.*													
Bracebridge	1,029	1,126	1,086	1,127	1,023	986	902	851	627	582	.....	.....	.....
Gravenhurst	1,217	1,207	1,127	938	976	883	883	.....	.....	.....	.....	.....	.....
Urban	2,246	2,333	2,213	2,065	1,999	1,869	1,785	851	627	582	.....	.....	.....
Total	12,604	12,620	11,463	10,773	10,584	10,035	9,046	7,688	5,948	5,861	5,581	5,140	4,310
PARRY SOUND:													
Armour	647	623	554	435	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chapman	647	587	542	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Foley	599	488	565	563	630	661	582	520	471	435	.....	.....	.....
Humphrey	329	267	377	438	486	535	672	501	482	447	451	.....	.....
McDougall	1,078	1,177	1,002	930	855	839	823	807	791	703	.....	.....	.....
McKellar	640	624	607	577	513	565	480	451	427	415	393	.....	.....
Ryerson	599	593	577	532	652	.....	.....	.....	.....	.....	.....	.....	.....
Strong	537	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total....(Rural).	4,976	4,359	4 224	3,475	3,136	2,600	2,557	2,279	2,171	2,000	844	.....	.....
ALGOMA:													
Assiginack	1,053	1,093	959	907	895	708	574	471	401	.....	.....	.....	.....
Carnarvon	478	478	429	381	380	372	.....	.....	.....	.....	.....	.....	.....
Gordon	1,000	810	808	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Howland	986	947	929	932	905	704	532	362	388	324	259	.....	.....
Oliver	245	206	172	163	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Joseph's Island	656	649	256	220	194	148	141	.....	.....	.....	.....	.....	.....
Sandfield	452	438	428	462	516	.....	.....	.....	.....	.....	.....	.....	.....
Sault Ste Marie	1,885	1,700	1,655	1,700	1,705	1,660	1,460	1,320	1,000	1,000	960	865	455
Shuniah	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tehkummah	377	416	400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rural	7,146	6,737	6,036	4,765	4,595	3,592	2,707	2,153	1,789	1,324	1,219	865	455
Port Arthur	6,097	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rat Portage	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Urban	6,097	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	13,243	6,737	6,036	4,765	4,595	3,592	2,707	2,153	1,789	1,324	1,219	865	455
CITIES:													
Belleville	9,467	9,478	10,021	10,038	9,987	9,991	9,112	9,112	9,241	9,768	8,359	8,359	7,361
Brantford	11,783	10,976	10,865	10,555	10,587	10,587	10,792	10,631	9,424	9,245	8,595	7,975	8,435
Guelph	10,134	9,854	9,854	10,057	10,260	10,072	9,918	9,680	9,017	8,584	7,998	7,798	7,189
Hamilton	39,216	38,196	36,946	35,977	35,009	34,268	33,511	33,511	32,609	31,708	31,957	30,201	27,959
Kingston	15,297	14,611	14,611	14,260	13,929	14,358	14,072	13,253	12,786	12,034	11,648	11,856	11,597
London	20,970	20,305	20,411	20,176	19,941	19,666	19,186	18,808	18,196	18 413	18.113	17,431	16,709
Ottawa	30,791	26,228	25,558	24,791	24,025	24,015	25,000	24,500	24,400	24,262	23.664	22,189	22,189
St. Catharines	9,931	10,050	9,576	10,026	10,475	10,475	11,079	10,143	9,820	9,497	9 201	8.852	8,503
St. Thomas	10,811	10,163	9,644	8,853	8,063	7,217	6,446	5,954	5,527	5,231	5,237	5,237	2,906
Toronto	105,211	91,796	81,372	76,934	75,110	73,813	70,867	67,386	71.693	68,678	67,995	62,647	57,020
Total	263,611	241,657	228,858	221,667	217,386	214,462	209,983	202,978	202,713	197,420	192,767	182,545	169,868

POPULATION.

TABLE No. XXXIX.—Summary of the Population of the Province, and of the number of Township, City, Town and Village Municipalities, for the thirteen years 1872–84.

——	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
Townships	1,117,880	1,115,841	1,120,574	1,134,192	1,131,288	1,128,889	1,117,580	1,108,671	1,088,753	1,071,757	1,064,040	1,047,812	1,049,931
Towns and Villages	372,567	352,507	345,934	337,639	335,209	330,216	318,472	308,894	291,053	274,570	248,815	223,877	204,986
Cities	263,611	241,657	228,858	221,667	217,386	214,462	209,983	202,978	207,713	194,420	192,767	182,545	169,868
Totals	1,754,058	1,710,005	1,695,366	1,693,498	1,683,883	1,673,567	1,946,035	1,620,343	1,582,519	1,543,747	1,505,622	1,454,234	1,422,785

NUMBER OF MUNICIPALITIES.

——	1884.	1883.	1882.	1881.	1880.	1879.	1878.	1877.	1876.	1875.	1874.	1873.	1872.
Townships	445	442	438	433	430	427	424	418	416	414	411	407	406
Cities, Towns and Villages	205	200	201	198	193	189	182	174	166	159	142	131	122
Totals	650	642	639	631	623	616	606	592	582	573	553	538	528

PUBLIC LANDS AND TIMBER LIMITS.

TABLE No XL.—Statistics of the Area and Value of Public Lands and Timber Limits sold in Ontario in the eighteen years 1867–1884.

Years.	Area of Lands Sold.							Timber Limits.	
	Crown Lands.	Clergy Lands.	Common School Lands.	Grammar School Lands.	Total Public Lands Sold.	Value.	Average Value per Acre.	Area under License.	Accrued Dues, Rents, Bonuses, etc.
	Acres.	Acres.	Acres.	Acres.	Acres.	$	$ c.	Sq. Miles.	$
1867	11,592	4,030	1,461	609	17,692	30,215	1 70	6,155	107,649
1868	23,299	9,528	4,322	2,835	39,984	60,649	1 52	11,584	190,238
1869	33,275	11,312	6,183	2,447	53,217	143,754	2 70	12,066	508,562
1870	37,538	10,162	3,256	1,263	52,219	69,791	1 34	12,005	379,965
1871	78,037	8,535	3,702	1,998	92,272	158,566	1 72	12,534	570,882
1872	113,623	16,100	2,068	3,906	135,697	185,071	1 36	12,358	659,156
1873	98,715	33,448	4,908	13,244	150,315	215,376	1 43	14,555	568,725
1874	96,995	20,532	3,583	11,652	132,762	180,874	1 36	15,259	425,505
1875	51,952	6,434	1,945	4,622	64,953	79,960	1 08	15,769	377,504
1876	51,387	7,255	2,039	3,511	64,192	83,005	1 11	14,981	362,398
1877	35,506	5,287	3,551	2,327	46,671	59,340	1 28	16,132	409,340
1878	39,164	3,757	2,299	3,375	48,595	51,055	1 05	16,005	293,310
1879	25,071	2,488	1,463	1,279	30,301	35,219	1 13	16,084	342,894
1880	30,722	1,977	1,002	1,389	35,090	31,955	0 91	15,940	413,416
1881	88,543	7,126	1,292	1,295	98,256	64,508	0 66	15,612	537,934
1882	98,814	4,693	555	1,959	106,021	106,292	1 00	17,989	547,103
1883	69,357	3,233	448	863	73,901	65,446	0 89	16,886	480,490
1884	61,189	3,669	337	730	65,925	55,425	0 84	16,840	421,485
Totals	1,044,779	159,566	44,414	59,304	1,308,063	1,676,501	1 28	.....	.....

SCHOOLS.

TABLE No. XLI.—Statistics of the High, Public and Separate

Year.	Population between 5 and 16 years.	HIGH SCHOOLS.								PUBLIC					
		Number of schools.	Number of pupils on roll.	Average attendance.	Number of teachers employed.	Total salaries paid.	Average salary paid.	Total expenditure for school purposes.	Expenditure per capita of average attendance.	Number of schools.	Number of pupils on roll.	Average attendance.	Number of teachers employed.		
													Male.	Female.	Totals.
						$	$	$	$ c.						
1842..	141,143	25	.....	.....	.....	.....	.....	.....	.....	1,721	65,978	.....	.....	.....	.....
1843*	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1844..	183,539	25	.....	.....	.....	.....	.....	.....	.....	2,610	96,756	.....	.....	.....	.....
1845..	202,913	31	.....	.....	.....	.....	.....	.....	.....	2,736	110,002	.....	.....	.....	2,860
1846..	204,580	32	.....	.....	.....	.....	.....	.....	.....	2,589	101,912	.....	.....	.....	2,925
1847..	230,975	32	1,000	.....	.....	.....	.....	.....	.....	2,727	124,829	.....	2,365	663	3,028
1848..	241,102	33	1,115	.....	.....	.....	.....	.....	.....	2,800	130,739	.....	2,507	670	3,177
1849..	253,864	39	1,120	.....	.....	.....	.....	.....	.....	2,871	138,465	.....	2,505	704	3,209
1850..	259,258	57	2,070	.....	.....	.....	.....	.....	.....	2,959	151,891	52,630	2,597	779	3,376
1851..	258,607	54	2,191	.....	.....	.....	.....	.....	.....	2,985	168,159	58,053	2,551	826	3,377
1852..	262,755	60	2,343	.....	.....	.....	.....	.....	.....	2,992	179,587	61,862	2,541	847	3,388
1853..	268,957	64	3,221	.....	.....	.....	.....	.....	.....	3,093	194,736	67,112	2,501	938	3,439
1854..	277,922	64	4,287	.....	92	43,490	473	47,033	.....	3,200	204,168	71,679	2,508	1,031	3,539
1855..	297,623	65	3,726	.....	95	46,255	487	54,140	.....	3,284	222,979	78,043	2,531	977	3,508
1856..	311,316	61	3,386	.....	90	47,659	529	63,023	.....	3,391	243,935	85,377	2,562	1,032	3,594
1857..	324,888	72	4,973	.....	107	57,552	538	76,707	.....	3,631	262,673	92,936	2,727	1,244	3,971
1858..	360,578	75	4,459	.....	112	52,940	473	61,662	.....	3,772	283,692	98,491	2,901	1,183	4,084
1859..	362,085	81	4,381	.....	121	61,564	509	74,850	.....	3,848	288,598	104,653	3,037	1,050	4,087
1860..	373,589	88	4,546	.....	127	64,005	504	77,557	.....	3,854	301,104	113,348	3,019	1,100	4,119
1861..	384,980	86	4,765	.....	123	71,034	577	81,108	.....	3,910	316,287	119,711	2,960	1,219	4,179
1862..	403,302	91	4,982	.....	131	73,211	559	86,244	.....	3,995	329,033	128,714	3,028	1,216	4,244
1863..	412,367	95	5,352	.....	141	76,121	540	85,910	.....	4,013	344,949	131,505	3,016	1,317	4,333
1864..	424,565	95	5,589	.....	139	75,854	546	85,816	.....	4,077	354,330	141,343	2,928	1,507	4,435
1865..	426,757	104	5,754	.....	149	81,562	547	94,241	.....	4,151	365,552	148,248	2,849	1,672	4,521
1866..	431,815	104	5,719	.....	151	87,055	576	113,887	.....	4,222	372,320	149,528	2,855	1,727	4,582
1867..	447,726	102	5,696	2,712	159	94,820	596	124,181	45 79	4,261	382,719	155,368	2,767	1,913	4,680
1868..	464,315	101	5,649	2,542	161	95,848	595	117,647	46 28	4,318	399,305	160,673	2,683	2,077	4,760
1869..	479,490	101	6,608	2,924	165	97,009	588	114,502	39 16	4,359	411,746	168,722	2,681	2,145	4,826
1870..	483,966	101	7,351	3,432	172	105,153	611	137,566	40 08	4,403	421,866	171,603	2,657	2,272	4,929
1871..	489,615	102	7,490	3,745	174	113,862	654	152,880	40 82	4,438	425,126	177,923	2,557	2,510	5,067
1872..	495,756	104	7,968	4,040	239	141,812	593	210,005	51 98	4,490	433,256	178,117	2,539	2,683	5,222
1873..	504,869	108	8,437	4,460	252	165,358	656	234,215	52 51	4,562	438,911	181,067	2,490	2,883	5,373
1874..	511,603	108	7,871	4,256	248	179,946	726	286,593	67 34	4,592	441,261	181,048	2,509	2,949	5,458
1875..	501,083	108	8,342	4,499	253	184,752	730	300,741	66 85	4,678	451,568	186,800	2,556	3,182	5,738
1876..	502,250	104	8,541	4,789	266	195,906	736	304,948	63 68	4,875	465,243	199,704	2,685	3,198	5,883
1877..	494,804	104	9,229	5,287	280	211,607	756	343,710	65 00	4,955	465,908	204,635	2,915	3,219	6,134
1878..	492,360	104	10,574	6,054	298	225,010	748	396,010	65 41	4,913	463,405	211,416	2,956	3,184	6,140
1879..	494,424	104	12,136	7,099	320	241,097	753	400,788	56 46	4,932	462,233	206,369	3,052	3,198	6,250
1880..	489,924	104	12,910	7,393	335	247,894	740	413,930	55 99	4,941	457,734	207,334	3,164	3,239	6,403
1881..	484,224	104	12,136	7,424	333	257,218	772	345,850	46 59	5,043	451,449	202,252	3,257	3,291	6,548
1882..	483,817	104	12,348	6,728	332	253,864	765	343,720	51 09	5,010	445,364	200,602	2,964	3,503	6,467
1883..	478,791	104	11,843	6,454	347	266,317	767	348,946	54 07	5,058	438,192	201,856	2,732	3,782	6,514

* No report in consequence of

SCHOOLS.

Schools of Ontario for the forty-two years 1842-1883.

SCHOOLS.				SEPARATE SCHOOLS.										
							Number of teachers employed.							
Total salaries paid teachers.	Average salary paid.	Total expenditure for school purposes.	Expenditure per capita of average attendance.	Number of schools.	Number of pupils on roll.	Average attendance.	Male.	Female.	Totals.	Total salaries paid teachers.	Average salary paid.	Total expenditure for school purposes.	Expenditure per capita of average attendance.	YEAR.
$	$	$	$											
166,000	....	....	....	....	....	....	....	....	....	....	....	....	....	1842
....	....	....	....	....	....	....	....	....	....	....	....	....	....	*1843
206,856	....	....	....	....	....	....	....	....	....	....	....	....	....	1844
286,056	100	....	....	....	....	....	....	....	....	....	....	....	....	1845
271,624	93	....	....	....	....	....	....	....	....	....	....	....	....	1846
310,396	102	....	....	....	....	....	....	....	....	....	....	....	....	1847
344,276	108	....	....	....	....	....	....	....	....	....	....	....	....	1848
353,912	110	....	....	....	....	....	....	....	....	....	....	....	....	1849
353,716	105	410,472	7 80	....	....	....	....	....	....	....	....	....	....	1850
391,308	116	468,644	8 07	16	....	....	....	....	....	....	....	....	....	1851
428,948	127	529,314	8 56	18	....	....	....	....	....	....	....	....	....	1852
489,764	142	617,836	9 20	32	....	....	....	....	....	....	....	....	....	1853
578,868	163	754,340	10 52	44	....	....	....	....	....	....	....	....	....	1854
670,988	191	885,959	11 35	41	4,885	2,076	37	20	57	9,120	160	13,313	6 41	1855
767,340	214	1,057,636	12 39	81	7,210	3,064	60	35	95	12,340	130	20,472	6 68	1856
841,489	212	1,179,790	12 59	100	9,694	4,320	60	52	112	18,743	167	32,368	7 49	1857
760,885	186	1,014,929	10 30	94	9,991	4,601	64	54	118	16,731	142	28,206	6 13	1858
836,322	205	1,079,483	10 31	105	12,994	5,208	78	70	148	23,003	155	30,563	5 87	1859
872,386	212	1,128,414	9 95	115	14,708	5,663	81	81	162	23,205	143	31,360	5 54	1860
893,585	214	1,160,477	9 70	109	13,631	6,222	71	86	157	24,528	156	30,941	4 97	186
934,588	220	1,200,614	9 33	109	14,700	6,370	87	75	162	25,188	155	31,379	4 93	1862
962,114	222	1,220,638	9 28	120	15,859	6,531	78	93	171	25,441	149	33,809	5 18	1863
965,976	218	1,243,168	8 80	147	17,365	8,226	83	107	190	30,980	163	42,150	5 12	1864
1,007,099	223	1,309,659	8 83	152	18,101	8,518	81	119	200	33,953	170	46,220	5 43	1865
1,034,134	226	1,342,194	8 98	157	18,575	8,337	70	137	207	32,746	158	45,039	5 40	1866
1,058,686	226	1,424,560	9 17	161	18,924	8,606	82	128	210	34,830	166	48,628	5 65	1867
1,107,698	233	1,532,983	9 54	162	20,594	9,305	94	142	236	38,846	165	55,452	5 96	1868
1,136,537	235	1,568,147	9 29	165	20,684	9,331	94	134	228	38,629	169	56,750	6 08	1869
1,180,942	240	1,653,561	9 64	163	20,652	10,035	96	140	236	41,739	177	58,500	5 83	1870
1,249,083	247	1,733,476	9 74	160	21,200	10,371	84	155	239	42,393	177	69,818	6 73	1871
1,325,770	254	2,138,554	12 01	171	21,406	10,584	87	167	254	45,824	180	68,810	6 50	1872
1,470,817	274	2,521,256	13 92	170	22,073	11,123	91	178	269	49,306	183	83,270	7 49	1873
1,596,606	292	2,776,968	15 34	166	22,786	11,850	92	186	278	51,144	184	88,364	7 46	1874
1,700,074	296	2,902,453	15 54	165	22,673	11,774	89	191	280	58,026	207	90,627	7 70	1875
1,775,300	302	2,899,973	14 52	167	25,294	12,779	95	207	302	63,021	209	106,483	8 33	1876
1,867,899	305	2,853,223	13 94	185	24,952	12,549	105	229	334	70,200	210	120,266	9 58	1877
1,940,906	318	2,768,788	13 10	177	25,610	13,172	104	229	333	79,301	211	120,559	9 15	1878
1,997,657	320	2,710,253	13 13	191	24,779	13,073	101	245	346	75,165	217	122,831	9 40	1879
2,035,895	318	2,693,589	12 99	196	25,311	12,734	100	244	344	77,285	225	128,463	10 09	1880
2,030,159	310	2,720,547	13 45	195	24,819	13,012	105	269	374	75,860	203	123,724	9 51	1881
2,060,353	319	2,683,254	13 38	193	26,148	13,574	98	292	390	84,095	216	154,340	11 37	1882
2,118,485	325	2,954,818	14 64	194	26,177	13,705	97	300	397	91,702	231	153,611	11 21	1883

a change in the School Law.

SCHOOLS.

TABLE No. XLII.—Summary Statistics of the High, Public and Separate Schools of Ontario for the thirty years, 1854–1883.

Years.	Population between the ages of 5 and 16 years.	High, Public and Separate Schools.						Superannuation Fund.				
		Schools in operation.	Pupils enrolled of all ages.	*Average attendance.	Teachers employed.	Salaries paid Teachers.	Total Expenditure.	No. on List.			Total Payments.	Average Payments.
								Male.	Female.	Total.		
						$	$				$	$
1854	277,922	3,308	208,455	71,679	3,631	622,358	801,373	40	...	40	3,344	84
1855	297,623	3,390	231,590	80,119	3,660	726,363	953,412	78	2	80	5,618	70
1856	311,316	3,533	254,531	88,441	3,779	827,339	1,141,131	122	6	128	6,535	51
1857	324,888	3,803	276,440	97,256	4,190	917,784	1,288,865	119	6	125	5,112	41
1858	360,578	3,941	298,142	103,092	4,314	830,556	1,104,797	147	8	155	2,663	17
1859	362,085	4,034	505,973	109,861	4,356	920,899	1,184,896	145	9	154	3,922	25
1860	373,589	4,057	320,358	119,011	4,408	959,596	1,237,331	143	8	151	4,085	27
1861	384,980	4,105	334,683	125,933	4,459	989,147	1,272,526	152	9	161	4,081	25
1862	403,302	4,195	348,715	135,084	4,537	1,032,087	1,318,237	154	10	164	5,438	33
1863	412,367	4,228	366,160	138,036	4,645	1,063,676	1,340,357	156	12	168	3,245	19
1864	424,565	4,319	377,284	149,569	4,764	1,072,810	1,371,134	146	12	158	3,611	23
1865	426,757	4,407	389,407	156,766	4,870	1,122,614	1,450,120	143	11	154	3,997	26
1866	431,815	4,483	396,614	157,865	4,940	1,153,935	1,501,120	134	11	145	3,726	26
1867	447,726	4,524	407,339	166,686	5,049	1,188,336	1,597,369	135	12	147	4,162	28
1868	464,315	4,581	425,548	172,520	5,157	1,242,392	1,706,082	131	12	143	5,957	42
1869	470,400	4,625	439,038	180,977	5,219	1,272,175	1,739,399	119	12	131	6,332	48
1870	483,966	4,667	449,869	185,070	5,337	1,327,834	1,849,627	118	13	131	6,376	48
1871	489,615	4,700	453,816	192,039	5,480	1,405,338	1,956,174	112	12	124	6,016	49
1872	495,756	4,765	462,630	192,741	5,715	1,513,406	2,417,369	128	13	141	11,942	85
1873	504,869	4,840	469,421	196,650	5,894	1,685,481	2,838,741	139	14	153	19,097	125
1874	511,603	4,866	471,918	197,154	5,984	1,827,696	3,151,925	171	18	189	22,910	121
1875	501,083	4,951	482,583	203,073	6,271	1,942,852	3,293,821	205	24	229	26,509	116
1876	502,250	5,146	499,078	217,272	6,451	2,034,227	3,311,404	241	25	266	31,769	119
1877	494,804	5,244	500,089	222,471	6,748	2,149,706	3,317,199	269	24	293	35,484	12
1878	492,360	5,194	499,589	230,642	6,771	2,234,217	3,285,357	307	32	339	41,319	122
1879	494,424	5,227	499,148	226,541	6,916	2,313,919	3,233,872	328	32	360	43,774	122
1880	489,924	5,241	495,955	227,461	7,082	2,361,074	3,235,982	353	38	391	38,229	123
1881	484,224	5,342	489,404	222,688	7,255	2,363,237	3,190,121	361	28	399	49,129	123
1882	483,817	5,307	483,860	220,904	7,189	2,398,312	3,181,314	381	41	422	51,000	121
1883	478,791	5,356	476,212	222,015	7,258	2,476,504	3,457,375	373	49	422	51,500	122

* Average attendance for years 1854–66 does not include High Schools.

(No. 85.)

Detailed Statement of all Bonds and Securities registered in the Provincial Registrar's Office during the year 1884. (*Not printed.*)

RETURN

To an Order of the Legislative Assembly dated 16th February, 1885, That there be laid before the House a Return shewing what sums have been paid to George R. Patullo on any account whatever, since 1st January, 1883, with the dates of the payment thereof, and the purpose for which such payments were made.

By Command,

ARTHUR S. HARDY,
Provincial Secretary.

Provincial Secretary's Office,
Toronto, 27th March, 1885.

MEMO. OF PAYMENTS TO G. R. PATULLO FROM 1st JANUARY, 1883.

1883.		
July 7th, advance	$300 00	
September 21st, advance	300 00	
September 25th, " (*Re* Exhibit)	350 00	
November 15th, "	600 00	
December 15th, "	300 00	
1884.		
May 30th, "	350 00	
December 8th, balance of account	663 95	
		$2,863 95

Analysis of Expenditure.

G. R. Patullo, allowance from 26th June, 1883, to July 1st, 1884, at five dollars per diem	$1,855 00
G. R. Patullo, expenses from 26th June to 1st December, 1883 (and eight days since), at five dollars per diem	830 00
G. R. Patullo, sundry disbursements (*re* Exhibit)	178 95
Total	$2,863 95

(No. 87.)

Return of copies of all correspondence and other documents relating to the cancellation of location of lot number 33 in the first concession of Snowden, in the Provisional District of Haliburton, and of all correspondence and documents relating to the sale or relocation of the same lot. (*Not printed.*)

(No. 88.)

Return of all correspondence between the Municipal Council of the Township of Roxborough, or any member or officer thereof, and the Provincial Secretary, or any officer of his Department, with reference to the claim made by the License Board of Stormont upon the said Municipality for payment of fifty dollars towards the expenses of enforcing the Temperance Act of 1864 in the Township of Roxborough. Also, shewing the amount demanded from each Municipality in which the said Act was in force for each of the years 1882, 1883 and 1884, and the amount paid in respect of such demand. Also, shewing how the said sum of fifty dollars demanded from the said Township of Roxborough is made up. (*Not printed.*)

SECOND ANNUAL REPORT

Of the Inspector of Legal Offices, being for the year ending 31st December, 1884.

Presented to the Legislative Assembly by command of His Honour the Lieutenant-Governor.

By Command,

ARTHUR S. HARDY,
Secretary.

Provincial Secretary's Office,
Toronto, 27th March, 1885.

SECOND ANNUAL REPORT

OF THE

INSPECTOR OF LEGAL OFFICES.

THE HONOURABLE OLIVER MOWAT,
Attorney-General of Ontario.

SIR,—On the 4th day of July last, by an Order of Council, approved by His Honour the Lieutenant-Governor, bearing that date, the offices of the Registrars of Surrogate Courts and the County Court Clerks, where they were held by Local Registrars of the High Court of Justice, were added to my duties. I have accordingly inspected these offices, and also during 1884 inspected all the other offices under my inspection, with the exception of four Local Masters' offices, namely those in Milton, Orangeville, Brantford and Lindsay, which were closed in consequence of the absence of the Masters at the time of my visiting these places.

The number of offices thus inspected by me was 232, that is to say, the offices of 39 Sheriffs, 33 Local Masters, 19 Deputy Registrars, 20 Local Registrars, 23 Surrogate Registrars, 20 County Court Clerks, 39 County Crown Attorneys and 39 Clerks of the Peace, these two last mentioned offices being held by the same person, excepting in the cases of Toronto and Owen Sound, where the offices are distinct.

Several changes in the *personnel* of these officers have taken place since my former Report, namely :—

Sheriffs—The late Colin Munroe has been succeeded by Mr. Dugald Brown, as Sheriff of the County of Elgin ; Mr. John McEwan, by Mr. John C. Iler, as Sheriff of the County of Essex ; Mr. H. W. Burke, by Mr. Isaac O. Proctor, as Sheriff of the United Counties of Northumberland and Durham ; and the Shrievalty of the United Counties of Leeds and Grenville, has been filled by the appointment of Mr. James Smart.

Local Masters—The late Mr. J. W. Hall has been succeeded by Mr. A. M. McKinnon, as Local Master and Deputy Registrar at Guelph ; His Honour Judge Jellett has been appointed Local Master at Picton in the place of Mr. S. S. Lazier ; Mr. Robert Miller at St. Thomas, in the place of Mr. James Shanly ; Mr. Alfred Frost, at Owen Sound, in the place of Mr. James Masson ; and His Honour Judge Hamilton, appointed to the new District of Thunder Bay.

Local Registrars—Mr. John Twigg has been appointed Local Registrar at Picton ; Mr. David McLaws at St. Thomas ; Mr. George Inglis at Owen Sound ; Mr. Charles Kreissman at Port Arthur ; and Mr. Alexander E. McDonald, Local Registrar, County Court Clerk and Surrogate Registrar at Cornwall. The three first named, having been Deputy Clerks of the Crown, became Local Registrars, by virtue of the Judicature Act, sec. 64, ss. 4.

County Crown Attorneys and Clerks of the Peace.—Mr. George E. Henderson, Q.C., for the County of Hastings, in the place of the late C. L. Coleman; Mr. John Maxwell, for the United Counties of Prescott and Russell, in the place of Mr. E. T. Dartnell; Mr. J. J. Kelso, for the District of Algoma, in the place of the present Judge Hamilton; and Mr. A. R. Lewis, for the new District of Thunder Bay.

Besides my regular official inspections, I conducted 11 investigations, either in consequence of complaints having been made against the officers, or of irregularities discovered by me in the course of my inspections.

Sheriffs' Offices.

In consequence of the want of uniformity in the system of keeping their books discovered by me during my first inspection, I determined to introduce into these offices a uniform system of books, so as not only to facilitate a ready and thorough inspection, but also to assist the Sheriffs in carrying on the work of their offices, and I have during the past year supplied this want. The books prepared by me were, a Process book, two Execution books, for goods and lands respectively, a Cash book and a Fee book. I permitted several Sheriffs who had comparatively new books in their offices, and which had been well kept and little used, to continue to use them for the present, as I desired to put the counties to no expense which could be properly avoided.

Such of the Sheriffs as have used the new books have expressed their entire satisfaction with them.

I regret to state that in several of the offices I found that not only overcharges had been of frequent occurrence, but also that execution moneys were not promptly paid over to the parties entitled thereto. The overcharges most frequently made were for fees on Returns of writs of *Fi. fa.* against goods and lands, more particularly the latter. In County Court actions, several Sheriffs had been in the habit of charging $1.15 as their fees on return of *Fi. fa.* goods, and 60cts. for *Fi. fa.* lands, whereas the legal fee is 85cts. for the former and 35cts. for the latter. In High Court actions, as much as $2.50 had been charged for return of *Fi. fa* goods and $1.50 for *Fi. fa.* lands, instead of $1.50 for the former and 75cts. for the latter. These overcharges in the aggregate amount to a large sum. Another overcharge of frequent occurrence is in poundage, many Sheriffs charging it upon the full amount seized or realized, instead of the amount paid over by them, for example; A seizure is made and $1,000 is realized by the Sheriff, his fees for receiving writ, advertising, possession and selling, amount to, say $100; instead of deducting this sum from the $1,000 and charging poundage on the balance or $900, a Sheriff guilty of this overcharge, charges poundage on the $1,000 and adds it to the other fees and expenses. When the expenses are large the amounts thus overcharged amount to considerable sums.

With respect to retaining execution moneys, I found that this practice was not followed to such an extent this past year as on my first inspection, although still too frequent. In interpleader cases moneys have been thus retained contrary to the Judges orders for payment into Court. Indeed I found very few Sheriffs who had promptly obeyed the orders of the Court in this respect. In all cases of irregularity I gave such instructions as I hope will prevent their recurrence.

One very gross overcharge appearing in my inspection, was in the endorsement on writs of execution by Solicitors for their fees for such writs. The sum so endorsed ranged from $5 to $15, as Solicitors' costs for one writ against goods in the High Court of Justice, and from $3.50 to $10 for a similar writ in the County Court. These writs, so endorsed, were forwarded or handed to the Sheriff with instructions to collect such sums so endorsed. I found that many Sheriffs collected these sums. In a County Court case which came under my notice, the sum charged on an alias writ of *fi. fa.* against the goods of the defendant, and which had been renewed only twice prior to the issue of the alias, was the sum of $50 instead of $10.50, the lawful charge. In the same case the Solicitors also charged and endorsed on the same writ the sum of $10 as their fees for obtaining a transcript of the Judgment from the Division Court, although he was not entitled to any such fee. The debt was originally $58.49 for which Judgment had been obtained in the Division Court.

Acting upon these instructions the Sheriff made a levy on the Defendant's goods for $118.49, together with interest on $68.49 from the 3rd of April, 1878, amounting to $24.50, and also levied for Sheriff's fees, amounting to the sum of $11.74, instead of $30.62, the proper amount of such fees; and the Defendant's cattle were sold for the sum of $102. After deducting the amount levied for his fees and disbursements, the Sheriff paid the Plaintiff's Solicitors $60.25, and had still an execution in force in his hands against the Defendant's goods for $82.73, including interest, the overcharges in this case amounted to $62.52.

Another case of what must be regarded as deliberate extortion was in an ejectment suit where the plaintiff was not entitled to any costs whatever, the judgment not giving him any, yet the Solicitor endorsed on his writ of possession a direction to the Sheriff to levy of the goods of the defendant the sum of $6 for the costs of issuing such writ, together with the Sheriff's fees and poundage. The Sheriff followed his instructions and recovered from the defendant not only the $6 for the costs of the writ, but also his own fees amounting to the sum of $12.15 additional; the defendant no doubt was either ignorant of his rights or preferred paying these costs rather than risk publicity in the matter.

With the approval of several of the Judges of the High Court, I addressed a circular to each of the Sheriffs throughout the Province upon the subject, a copy of which I submit herewith as Appendix A.

Several Sheriffs at first objected to carrying out my instructions in this matter, being desirous of avoiding a conflict with the Solicitors as to their fees.

I have during the year settled several disputed accounts of Sheriffs at the request of all the parties interested, thus saving the expense of an application to a Judge or Taxing Officer.

The Creditors' Relief Act, 1880, coming into force on the 25th day of March last, caused a considerable amount of correspondence immediately upon the issue of the Proclamation bringing the Act into force, I called the attention of all the Sheriffs to the fact and prepared for issue the book required to be kept by them under its provisions.

Many questions of practice arising in the carrying out of the Act, have been referred to me.

Only one judicial decision has been given on the Act during the year, namely, that by His Honour Judge McDougall in the case of Walton *vs.* Murdock, referred in 20 C. L. J. 282.

There have been about 70 cases in which proceedings were taken under the Act during the year. Although, at first, the Sheriffs generally had objections to the Act on account of the labour and responsibility it imposed on them, yet as they have become better acquainted with its provisions I do not hear so much dissatisfaction expressed.

Local Masters, Deputy Registrars, Local Registrars, and County Court Clerks.

As anticipated in my first Annual Report I have had considerable correspondence with these Officers upon points of practice and the question of costs.

As in the case of Sheriffs, I found it necessary to prepare a Masters' Book with which the Masters, generally, have supplied themselves, the proceedings carried on in these offices, as well as the charges made, will, in consequence, no doubt become more uniform, whilst inspection will be the more easily accomplished.

In two or three cases only did I find that overcharges had been made in the Masters' Offices.

It having been brought to my notice, by the Officers of the Courts, that one or two Local Masters had taken evidence outside of the Counties for which they were appointed, I requested the Official Guardian to obtain the opinion of the Court as to the legality of their doing so. This he did, and it was decided by His Lordship Mr. Justice Proudfoot, that a Master had no such right without special authority. I thereupon advised the Masters of such decision in order to prevent a recurrence of this objectionable practice.

The Judges of the Chancery Division of the High Court, having become aware that

many of the Local Masters had, in infancy matters, under 12 Vict. (R.S.O., Cap. 40, Sec. 76), not only taken the depositions in support of the Petition, but retained such depositions, and made the orders for the disposal of the infants' estates without any notice to the official guardian, I was requested to advise Local Masters to forward all depositions in such cases to the Registrar of the Queen's Bench Division (who acts for the Master in Chambers in disposing of such matters), immediately upon their being taken; and in order to save expense to infants and their estates, in the payment of moneys out of Court to infants who become of age, and in settling the value of dowers, I at the same time instructed the Masters that when taking such depositions they should also take evidence as to the exact date of the birth of each infant and the precise age of the widow.

The expense saved to infants estates in having these applications disposed of in Toronto instead of in the country, is very much greater than is generally supposed. In some cases at least one-fifth of the costs have been saved.

In some cases I found that Local Masters had doubts as to their having jurisdiction in all the Divisions of the High Court of Justice, and not merely in the Chancery Division, more especially with reference to taking examinations of parties. As they have full jurisdiction in the three Divisions, I so advised them.

In many of the Deputy Registrars' Offices I found that overcharges were being constantly made, owing, for the most part, to an erroneous interpretation of the various Statutes and Orders of Court; thus showing the great necessity that exists for the adoption of a new tariff of disbursements. In consequence of such overcharges, I drew up a tariff according to the Statutes and Orders of Court in force (Appendix B), and forwarded a copy to each Deputy Registrar with a letter of instructions.

Some of the overcharges thus made are as follows:—Writ of summons, $1 for Officer, $1 for the Crown, instead of 50cts. for each. Subpœna, $1 for the Officer, nothing for the Crown, instead of 50cts. for each. *Fi. fa's* and other like writs, $1.50 for the Officer and 50cts. for the Crown, instead of $1 for the Officer and 50cts. for the Crown. Judgment, 30cts. a folio for the Officer and nothing for the Crown, instead of 30cts. a folio for the Officer and 60cts. for the Crown. Certificate of lispendens, $1 for the Officer, nothing for the Crown, instead of 50cts. for each. Certificate of Judgment, $1 for the Officer and nothing for the Crown, instead of 50cts. for each. More frequently, however, the last two items were charged at 50cts. for the Officer and nothing for the Crown.

The Judges of the Chancery Division, early in the year, decided that by the Judicature Act the former fee of $1 payable to the Crown, on all Chancery decrees or decretal orders, under R. S. O. Cap. 40, Sec. 151, was reduced to 60cts., as this was the amount charged in the other Divisions, under R. S. O. Cap. 39, Sec. 53. I immediately gave directions to the Deputy Registrars and Local Masters in accordance with this decision. And in accordance with the principle of this decision instructed them to require the payment of 20cts. for the Crown, on all bills of cost taxed by non-salaried officers. *Vide* R. S. O. Cap. 39, Sec. 53.

In several of the offices the taxations of bills of costs, have not been as strict as they should have been. This was owing, in many cases, to carelessness rather than to a want of knowledge on the part of the officer. In consequence of my instructions upon these points, I have received many letters for advice upon items in dispute, and about which the officer had doubts. In each case I have given directions as to what should be done, and these directions have been followed by the officers and adopted by the Solicitors engaged.

In a number of offices I found that the papers were not properly taken care of, and could not readily be found. Directions were given as to this, but, unless better accommodation is afforded than what is now possessed by some of these officers, it will be impossible for them to have the business conducted in as efficient a manner as is desirable.

No fee book having been heretofore kept by Local Registrars or Deputy Registrars, one is now in course of preparation which will enable them to make an accurate return of all fees received, whether in stamps or cash, and also any return as to the business of their offices, which may be required, without much additional trouble.

The above remarks as to carelessness, in respect to papers and taxation of costs, apply to a greater extent to the County Court Clerks than to Local or Deputy Registrars.

During the past year much has been done to assimilate the practice in the various offices, but, owing to the fact that the two practices of Chancery and Common Law, which existed prior to the passing of the Judicature Act still continue, in many respects, in the Head Offices at Osgoode Hall, it has been impossible to accomplish all that is desirable, and I fear it will be so until these two practices are assimilated by some rule of the Supreme Court of Judicature of Ontario. A step in this direction was lately taken by the Court in passing a rule, on the 15th day of December last, for the purpose of equalizing the business in the several Divisions of the High Court, and which provides that: "From and after the first day of January 1885, all writs of summons for the Commencement of Actions shall be issued by the Officers who now issue like writs in the Queen's Bench and Common Pleas Divisions of the said High Court of Justice, and shall be issued alternately in the Queen's Bench, Chancery and Common Pleas Divisions of the said High Court." It has been suggested that, in order to defeat the object of this rule, fictitious writs will be issued so as to enable the practitioner to continue in the Division he may prefer. I am of opinion, however, that no Solicitor will knowingly commit a contempt of Court by disobeying its rules in this respect.

Surrogate Registrars.

Soon after my appointment as Inspector of certain of the offices of the Surrogate Registrars, I discovered a striking difference in the amounts charged by the various Registrars as fees for the same service. The number of cases in which there were overcharges in favour of the official, were numerous; sometimes so glaring as to be evidently wilful. The following are instances of these overcharges: -Drawing order for grant, 50cts.; recording same, 50cts.; drawing order for inventory, 50cts.; recording same, 50cts.; attending Judge with, 50cts.; drawing petition and affidavits, $2; letters to parties, 50cts.; notice of inventory, 50cts. None of these charges are justified by the tariff. Computing the folios of wills at more than the actual number, was another overcharge frequently made. The aggregate of sums thus wrongfully collected throughout the Province during one year would amount to many hundreds of dollars. I also ascertained that, in a few cases, realty devised to Executors or Trustees to be sold, was charged for as if it had been personal property, and the fees of both Registrar and Judge charged accordingly. To prevent these overcharges from being continued I prepared a tariff (see Appendix C) of the proper fees to be demanded and taken by the Registrars for their own use, for the use of the Judges and those payable in stamps for the Crown, and forwarded a copy to each Registrar under my inspection with a letter of instructions.

In two or three offices I found that the books were not fully entered up, and that the papers were carelessly put away. In quite a number of offices no separate fee or cash book was kept, so that it was impossible to ascertain the charges made by these Registrars, I have a fee book in course of preparation which will not only enable a thorough inspection to be made in all cases, but also ensure a record of all charges being kept.

Papers were frequently found insufficiently stamped, and, sometimes, wholly unstamped, in consequence of which the government suffered loss of Revenue; the amount of fees thus payable to the Crown, and which I required to be paid in stamps and duly cancelled, was upwards of $1,650. The directions given by me to these officers as to their duties should prevent any of these irregularities again occurring.

County Crown Attornies and Clerks of the Peace.

I have summarized the returns of the Justices of the Peace throughout the Province, made to me by the Clerks of the Peace; this summary will be found as Appendix D; it shows the number of convictions and the various offences committed in each County, together with the amount of fines, forfeitures, penalties or damages imposed, the amounts received thereon and how appropriated, the amounts not paid by the defendants for which

default in payment punishment was inflicted, and the amounts unpaid by defendants but in respect of which no punishment was inflicted.

These returns show the convictions made by Justices of the Peace and not by Police Magistrates. I regret to state that the Clerks of the Peace have not generally followed the requirements of Sec. 6, Cap. 76, R. S. O., by recording the returns received by them in their Session Books.

I have added to this my second Annual Report, a Schedule containing a Return of all the fees and emoluments of the different Judicial officials in the Province (see Appendix E); also a Return of the business transacted in the offices of Local and Deputy Registrars, Deputy Clerks of the Crown, County Court Clerks, and Surrogate Registrars during the past year (Appendix F).

I regret to state that many of the Returns directed to be made to me under the provisions of 47 Vict. Cap. 10, Sec. 16, have been obtained only after considerable correspondence; I trust, however, that in the future they will be more promptly made.

During the year I have heard many expressions of approval as to the results of my inspection, not only from the different officials themselves, but more particularly from the members of the legal profession. One result of the present system of inspection has been the saving of several thousands of dollars per annum, in the aggregate, to litigants and parties who have to transact business with the different offices.

In addition to the results already attained, I look forward to the time when, by increased experience in the working of the different offices, I will be enabled to render still more uniform the practice and charges of officers throughout the Province, and thereby secure that confidence on the part of the public and legal profession in the thorough and upright performance of all official duties, which is so greatly to be desired in respect of all connected with the administration of Justice.

I have the honor to be, Sir,

Your most obedient servant,

JNO. WINCHESTER,
Inspector.

Osgoode Hall,
Toronto, March, 1885.

APPENDIX A.

(*Referred to in the foregoing Report.*)

Osgoode Hall,
Toronto, 8th October, 1884.

Sir,—I have the honour to inform you that whilst inspecting Sheriffs' offices lately I have found that it has been almost the invariable practice of some Solicitors to endorse upon writs of execution against goods as their fees for such writs the sums of $10, $12, and in some cases even more, in the High Court of Justice, and $6, $8 and $10 in the County Court, and similar sums for renewals; and further, that Sheriffs have been in the habit of collecting such sums, believing it to be their duty to obey the instructions thus given. Sheriffs so acting render themselves liable to be proceeded against, and, in the future, *must refuse* to levy for more than the legal charges for such writs, which are as follows:—

High Court writs, goods or lands,			original or alias,	each	$5 00
"	"	"	renewals,	"	3 75
County Court	"	"	"	"	2 25
"	"	"	original or alias,	"	3 00

Where money is made under goods writs, no fees whatever for lands writs are to be collected. See R. S. O., cap. 66, sec. 17, p. 803.

Endorsement of writs must be the same as the face of writs with respect to amounts, with fees for writ added ; if no costs are mentioned in writ, and debt or damages given, no costs, other than fees for writ, are to be levied. If no debt, damages or costs mentioned in writ, then no costs or fees of any kind are to be levied,

I have the honour to be, sir,

Your obedient servant,

JOHN WINCHESTER,
Inspector.

APPENDIX B.

(Referred to in the foregoing Report.)

TARIFF OF FEES TO BE TAKEN BY DEPUTY REGISTRARS, NOT PAID BY SALARY.

PROCEEDING.	CASH.	STAMPS.	TOTAL.
	$ c.	$ c.	$ c.
Writ of summons	50	50	1 00
" subpœna (including præcipe)	50	50	1 00
Fi. fas. and other writs (renewals, etc.)	1 00	50	1 50
Every appearance entered	20		20
" " " each defendant after first	10		10
Entering and filing affidavits on production, interrogatories and depositions, or other evidence	20		20
Filing every affidavit, writ, præcipe, or other proceeding	10		10
Amending every writ or other proceeding, per folio	20		20
Every judgment, and entering and docketing same, 30cts. per folio		60	
Taking account under Judgment	1 00		1 00
Taxing bill of costs	1 00	20	1 20
Forwarding papers, including bill of costs	50		50
Setting down a cause for hearing	8 00		8 00
Certificate of summons issued (lis pendens)	50	50	1 00
" judgment or order	50	50	1 00
And on every other certificate under seal of Court	50	50	1 00
For each folio of certificate over two folios	20		20
Searching files in office (if within one year)	20		20
Over one year and within two years	30		30
" two years or general search in one case	50		50
Marking every exhibit produced on the examination of witnesses	20		20
Swearing each witness	20		20
Attending on opening commission	1 00		1 00
" inspection of documents produced with affidavits, on production, per hour	1 00		1 00
Copy of papers required to be given out per folio	10		10
Examining and authenticating same when O.C. prepared by Solicitors, every three folios	05		05

JOHN WINCHESTER,
Inspector.

OSGOODE HALL,
TORONTO, 9th December, 1884

APPENDIX C.

(Referred to in the foregoing Report.)

OFFICE OF THE INSPECTOR OF LEGAL OFFICES,
OSGOODE HALL, TORONTO, 20th October, 1884.

Surrogate Court tariff of fees *allowable* for proving a will where personalty sworn at $1,000, or under, and not within Sec. 64 of the Surrogate Courts Act.

N.B.—In all cases the value of the real property is not to be considered in connection with the fees whether directed to be sold or not.

PROCEEDINGS.	FEES OF REGISTRAR.	FEES OF JUDGE.	IN STAMPS.
	$ c.	$ c.	$ c.
1. On application			50
2. Receiving and entering application for Probate and transmitting notice thereof to Surrogate Clerk	50		
3. Certificate of Surrogate Clerk			50
4. Receiving and entering Certificate of Surrogate Clerk	10		
5. Preparing all the necessary affidavits	1 00		
6. Renunciation, if any, with affidavits	1 00		
7. Order or fiat for grant		50	
8. Grant of Probate		2 00*	50*
9. For grant and entering same in Registrar's Book	1 00*		
10. Recording will in addition, 10cts. a folio, say 8 folios	80		
11. For Probate under seal	50		50
12. Transcript of will, 10cts. a folio, say 8 folios	80		
13. Notice of grant to Surrogate Clerk	25		
14. Copy of will for Surrogate Clerk, 8 folios	80		
15. Certificate thereon	50		
16. Swearing deponents, only charged when actually sworn by Registrar, 20cts. each, say 3	60		
17. Postages, no greater sum should be charged unless will extra heavy	25		
	$8 10	$2 50	$2 00

*Where the personalty is greater than $1,000 the only difference in the charges is as to the fee on the *grant* which increases according to the value of such personalty as below.

VALUE OF PERSONALTY.	FEES OF REGISTRAR.	FEES OF JUDGE.	IN STAMPS.
	$ c.	$ c.	$ c.
$1,200, or under, to $1,000	1 00	2 00	1 00
2,000, " 1,200	1 75	3 00	1 00
3,000, " 2,000	1 75	3 00	1 50
4,000, " 3,000	1 75	4 00	2 00
5,000, " 4,000	2 50	5 00	2 50
6,000, " 5,000	2 50	6 00	3 00
7,000, " 6,000	2 50	7 00	3 50
8,000, " 7,000	2 50	8 00	4 00

All above $8,000 the Registrar receives $4 only, the Judge $1 additional for every $1,000 or part thereof, and stamps 50cts. additional for every $1,000 or part thereof.

☞ No charge to be made by Registrar in connection with order or fiat for grant or inventory.

JNO. WINCHESTER,
Inspector.

Please post up in Office.

(Copy of letter accompanying above.)

Osgoode Hall,
Toronto, 18th October, 1884.

Sir,—I have the honour to inform you that, in consequence of the many different interpretations put upon the tariff of fees for services in connection with Surrogate Court matters, I have considered it advisable to state what are the proper fees to be charged, distinguishing those to be paid to the Registrars, Judge, and in Law Stamps, with the desire that, in future, all Registrars adopt same, I need scarcely state that the value of the realty devised is not to be considered in any way with reference to fees. The fee in the cases referred to in Sec. 64 of the Surrogate Courts Act is $2 of which 50cts. is to be paid to the Judge. In Guardianship cases, the Registrars' fees are provided for by Surrogate Court Rule as to Guardians No. 8. The Judge, however, is only entitled to $2 on each appointment of guardian, and the government to $1.50 in stamps, no matter what value the property may be, subject, however, to the provisions of SS. 2, Sec. 10, Cap. 129 R. S. O. As to costs in contentious matters, see tariff of fees. Allowances to Executors, etc., and audits are not contentious matters. I would urge that, in every case, the applicant be required to put in an inventory before the papers are submitted to the Judge for grant, thus insuring the payment of the correct fees—which is not now done—and, also, doing away with the question of an order for inventory which, in most cases, is a useless and unnecessary expense. I enclose herewith a tariff in non-contentious matters which you will please follow.

I beg to refer you to Secs. 6, 7, 21, and 22 of the Law Stamp Act, Sec. 3 Cap. 11, of 45 Vict. the three last lines of Sec. 71 of the Surrogate Courts Act, Sec. 65 of the Judicature Act, and the case of *Re* Dallas reported in 29 Q. B. 482, for your guidance.

I have the honour to be, Sir,

Your obedient servant,

JNO. WINCHESTER.

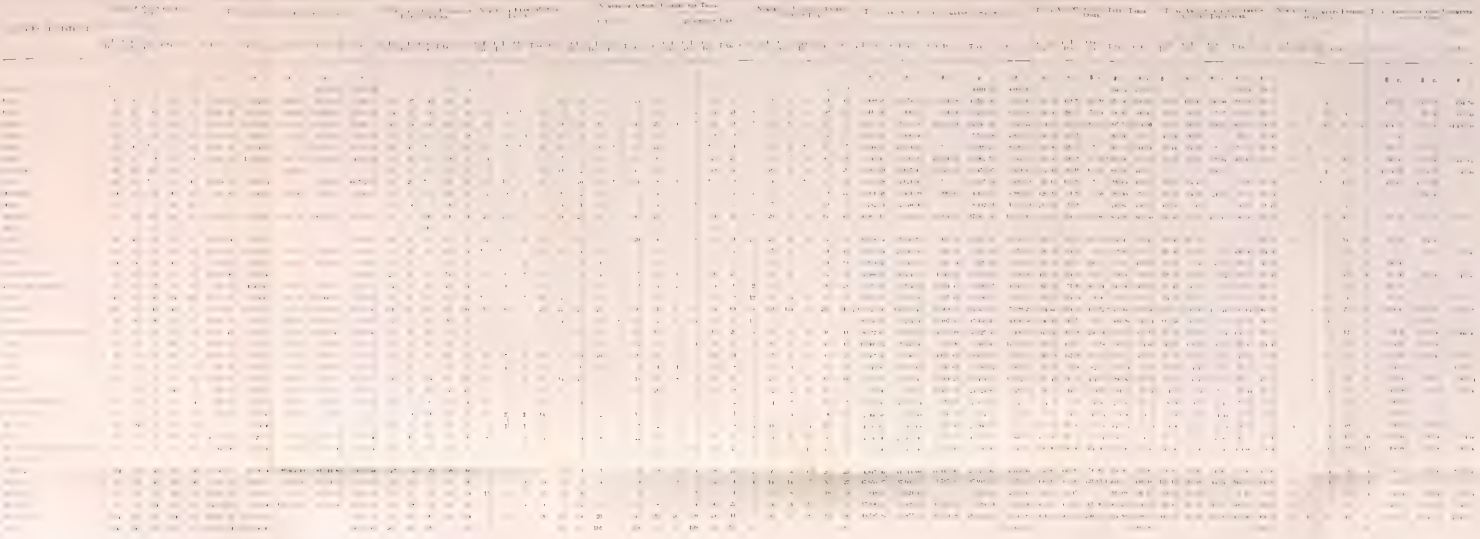
Return of

OF COSTS TAX UNDER.

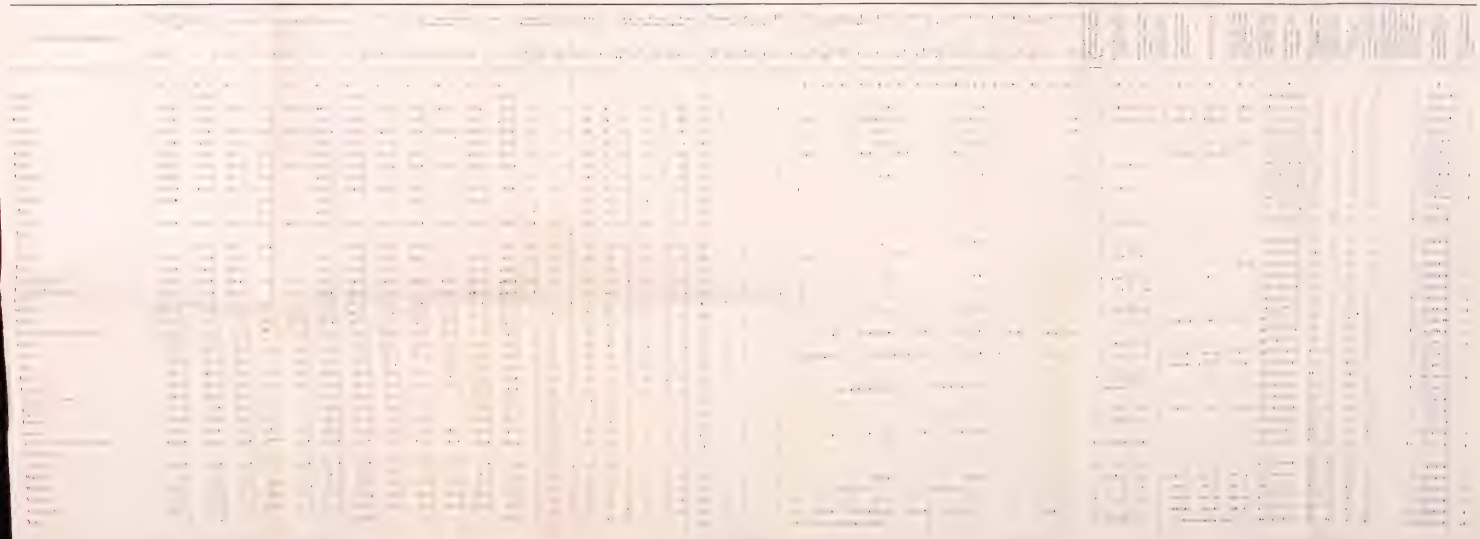
	Chy.	m.
1		
4	2	
T	59	
4	6	
1	9	
1	30	
	1	
	1	
	3	
1		
1	10	
	3	
1	1	
	2	
1	8	
4		
	10	

	Amount Earned.	
	$ c.	
	4774 13	
	487 00	
	820 90	
	629 05	
	733 52	
	390 25	
	1150 96	
	650 60	
	2138 12	
	226 00	
	871 85	
	466 65	
	242 20	
	680 94	
	28 00	
	549 80	
	330 89	
	2934 42	
	commut	
	100 80	
	169 20	
	640 69	
	253 00	
	287 9	
	144 0	
	2464 7	
	133 5	
	121 3	
	360 9	
	32 0	
	204 2	

APPENDIX I. — SHEWING A RETURN OF THE BUSINESS TRANSACTED BY LOCAL REGISTRARS, DEPUTY REGISTRARS, DEPUTY CLERKS OF THE CROWN, COUNTY COURT CLERKS AND SURROGATE REGISTRARS THROUGHOUT THE PROVINCE OF ONTARIO DURING THE YEAR ENDING 31st DECEMBER, 1884.

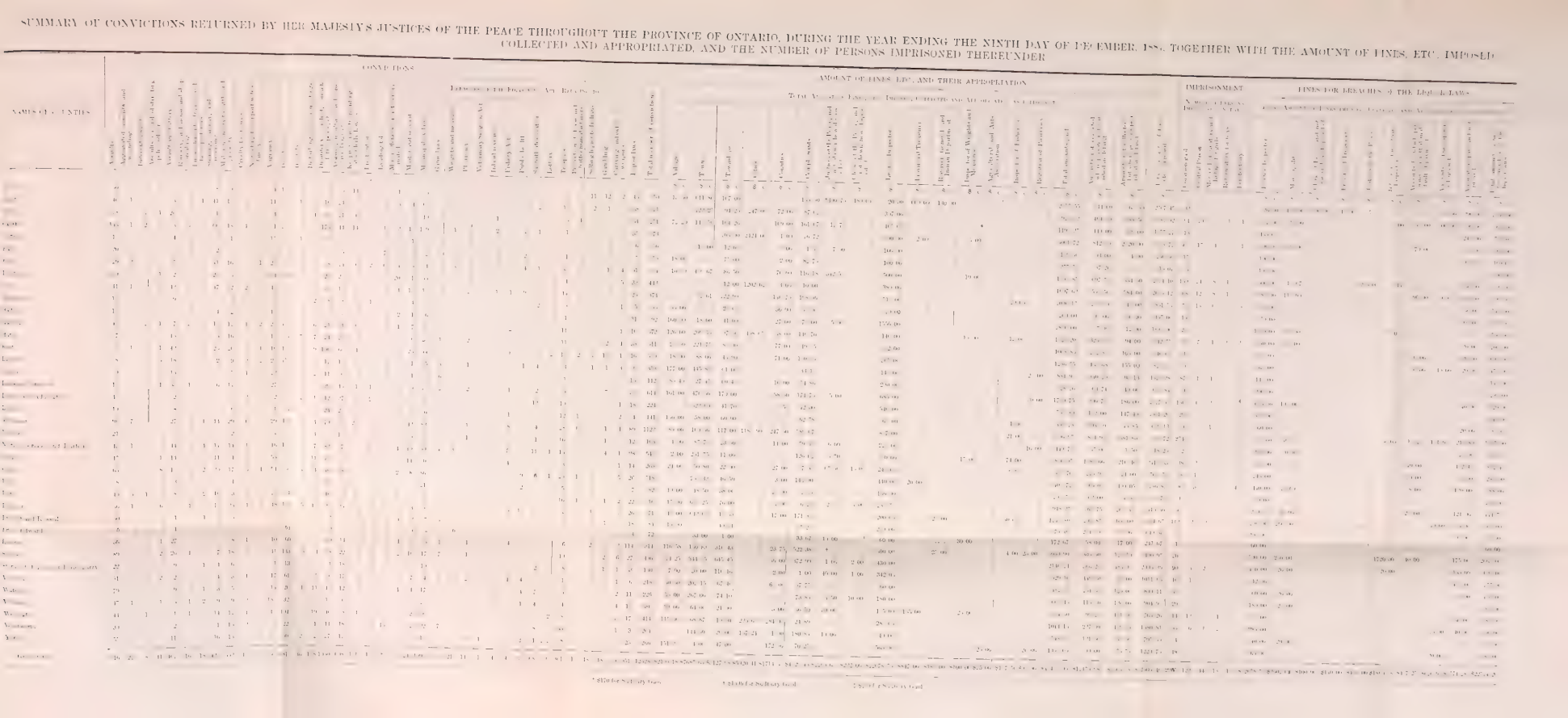


APPENDIX I. — Continued.



butter manufacturers.	Total amount of fines, etc., imposed.		Common gaol.	Amount Earned.	
	$	c.		$	c.
..	2767	45	3	4774	13
..	1982	92	9	487	00
4	1977	27	1	820	90
..	5933	72	30	629	05
..	236	50	1	733	52
..	315	01		390	25
..	2624	10	10	1150	96
..	2695	12	6	650	60
..	1851	56	7	2138	12
..	407	00	1	226	00
..	1895	00	2	871	85
				466	65
				242	20
				680	94
				28	00
				549	80
				330	89
				2934	42
				commut	
				100	80
				169	20
				640	69
				253	00
				287	9
				144	0
				2464	7
				133	5
				121	3
				360	9
				32	0
				204	2

SUMMARY OF CONVICTIONS RETURNED BY HER MAJESTY'S JUSTICES OF THE PEACE THROUGHOUT THE PROVINCE OF ONTARIO, DURING THE YEAR ENDING THE NINTH DAY OF DECEMBER, 1886, TOGETHER WITH THE AMOUNT OF FINES, ETC., IMPOSED COLLECTED AND APPROPRIATED, AND THE NUMBER OF PERSONS IMPRISONED THEREUNDER



SCHEDULE shewing Return of

COUNTY OR DISTRICT	COUNTY TOWN.	OFFICE.	OFFICER.	Amount Earned. $ c.
Perth	Stratford	Sheriff	John Hossie	4774 13
		Surrogate Judge	Judge Lizars	487 00
		Local Master	"	820 90
		County Attorney	John Idington, Q.C.	629 05
		Clerk of the Peace	"	733 52
		Local Registrar	Jas. Macfadden	390 25
		County Court Clerk	"	1150 96
		Surrogate Registrar	"	650 60
Peterboro'	Peterboro'	Sheriff	James A. Hall	2138 12
		Surrogate Judge	Judge Dennistoun	226 00
		Local Master	C. A. Weller	871 85
		Deputy Registrar	"	466 65
		County Attorney	"	242 20
		Clerk of the Peace	"	680 94
		Deputy Clerk of the Crown	John Moloney	28 00
		County Court Clerk	"	549 80
		Surrogate Registrar	"	330 89
Prescott & Russell	L'Original	Sheriff	J. D. Merrick	2934 42
		Surrogate Judge	Judge Daniell	commute
		Local Master	"	100 80
		County Attorney	John Maxwell	169 20
		Clerk of the Peace	"	640 69
		Local Master	John Fraser	253 0(
		County Court Clerk	"	287 9(
		Surrogate Registrar	"	144 0
Prince Edward	Picton	Sheriff	James Gillespie	2464 7(
		Surrogate Judge	Judge Jellett	133 5(
		Local Master	"	121 3(
		"	S. S. Lazier.	360 9(
		Deputy Registrar	"	32 0
		County Attorney	Philip Low, Q.C.	204 2

SCHEDULE shewing Return of Fees and Emoluments of the different County Judicial Officers in the Province of Ontario, earned and received during the year ending 31st December, 1884

County or District	County Town	Office	Officer	Amount Earned	Salary paid by the Government	Total Expenses and Salary	Total Earnings (Salary and all other sources)	Amount paid over during the year	Amount over paid over previous years	Total receipts	Total receipts (Salary and all other sources)	Amount due by	Net amount received	Net amount due by Officer (Salary and all other sources)	Remarks
				$ c	$ c	$ c	$	$ c	$ c	$ c	$ c	$ c	$ c	$ c	
[illegible]	Sault Ste Marie	Sheriff	W H Carney	1863 72	1400 00	3263 72	3263 72	3030 45		2695 49	2695 49	1021 64	1165 80	2230 88	
		Surrogate Judge	Judge McCrea	48 00		48 00		48 00		48 00			48 00		
		Local Master	"	5 40		5 40	41 40	5 40		5 40	41 40	5 00		46 40	
		County Attorney	T J Kelly	53 00		53 00						1 00			
		Clerk of the Peace	"	49 04	*143 78	192 82	236 26	145 82		135 82	135 82		145 82	230 26	Appointed 8th Nov 1884
		Local Registrar	T A P Towers		150 00	150 00		150 00		150 00			150 00		
		District Court Clerk	"	130 08	500 00	630 08		630 08		630 08		5 00	625 08		
		Surrogate Registrar		47 25		47 25	827 33	47 25		47 25	827 33	2 00	45 25	830 33	
[illegible]	Brantford	Sheriff	[illegible] Smith	1850 47	[illegible]	1850 47	4185 47	2155 83		2155 83	2155 83	1251 64	1204 11	1981 83	
		Surrogate Judge	Judge Dyas	Salary not stated		800 00									
		Local Master	"	691 95		691 95	731 95	731 95		731 95	731 95	30 00	721 95	721 95	
		County Attorney	C R VanNorman, Q C	402 85		402 85		402 85		402 85			402 85		
		Clerk of the Peace		692 10		692 10	1154 05	692 10		692 10	1154 05		692 10	1154 05	
		Local Registrar	W P Ridout	1850 [illegible]	67 50	908 65		907 [illegible]		907 [illegible]		10 00	897 [illegible]		
		County Court Clerk	"	784 [illegible]		784 [illegible]		777 79		777 79		20 00	777 79		
		Surrogate Registrar		678 [illegible]		678 [illegible]	2471 80	671 81		671 81	2360 95	20 00	650 81	2321 80	
[illegible]	Woodstock	Sheriff	W Sutter	4223 65		4223 65	4223 65	3330 44	810 [illegible]	4141 80	4141 80	1326 [illegible]	3014 [illegible]	2307 44	
		Surrogate Judge	Judge [illegible]	Salary not stated at		408 00	408 00	408 00			408 00		408 00	408 00	
		Local Master	W A McLean	39 40		39 40		32 40	266 80	962 00		5 00	957 00		
		Deputy Registrar	"	25 40		25 40	920 80	274 40		274 40	906 40		274 40	1 00	
		County Attorney	Thos Lucas	4 [illegible] 00		4 [illegible] 00		16 00		169 80		14 80	154 80		
		Clerk of the Peace	"	1296 00		1296 00	1765 00	1296 00		1296 00	1765 00	57 [illegible]	1238 [illegible]	1765 [illegible]	
		Deputy Clerk of the Crown	Wm. Gunn	164 30	1 [illegible] 8	611 30		574 30		611 30			574 30		
		County Court Clerk		1 [illegible] 4		1296 4		85 05	242 [illegible]	1 [illegible] 10		41 [illegible]	1 [illegible] 05		
		Surrogate Registrar	"	[illegible] 60		9 [illegible] 60	2441 [illegible]	53 60		53 [illegible]	241 [illegible]	250 [illegible]	27 [illegible]	2 [illegible] 4	
[illegible]	Owen Sound	Sheriff	[illegible] Sweetman	708 [illegible]		964 [illegible]	7064 [illegible]	1121 [illegible]	[illegible]	7 [illegible] 6	7071 10	5121 50	1 [illegible] 04	53 10	
		[illegible]	[illegible]	[illegible] 50		258 [illegible]	258 [illegible]	258 [illegible]		[illegible]	258 50		[illegible]	258 50	
		Local Master	W N Ness	2 [illegible]		74 [illegible]		174 [illegible]		[illegible] 7		1 01 [illegible]	[illegible] 40		
		[illegible]		[illegible]		6 1 [illegible]	1 10	114 [illegible]		11 [illegible]	20 [illegible]	[illegible]	1 [illegible]	20 [illegible]	
		[illegible]	[illegible]	[illegible]		18 80		148 80		11 [illegible]		16 00	[illegible] 80		

SCHEDULE shewing Return of Fees and Emoluments, etc. *Continued*

County or District	County Town	Office	Officer	Amount of Salary	Salary paid by the Government	Total Earnings and Salary	Total Deductions and Salary paid to the Government	Amount paid for Clerk hire during the year	Amount paid for Office Rent during the year	Total Expenditure	Total receipts by the Department of the Minister	Value of Fees not collected	Net Amount of Fees collected	Value of Fees collected but not paid over to the Department by the Officer	Remarks
				$ c	$	$ c	$ c	$ c	$ c	$ c	$	$ c	$	$	
[illegible]	[illegible]	[illegible] Police Magistrate	[illegible] Lees	914		914 45	1 [illegible]	914		914 45	1 [illegible]	[illegible] 00	[illegible] 00	1 21 [illegible]	
		Deputy Clerk of the Crown	T. H. [illegible]chester	[illegible] 08	4 00	813 00		713 [illegible]	20 00	811 [illegible]		110 00	711 [illegible]		
		County Court Clerk	"	1384 43		1384 43		1384 43	10 00	1394 [illegible]		240 00	1084 [illegible]		
		[illegible]	"	[illegible] 00		[illegible] 00	252 [illegible]	[illegible]	[illegible] 00	817 [illegible]	2483 23	110 00	206 [illegible]	2010 43	
[illegible]	[illegible]	Sheriff	Hon. [illegible]	144 70		144 70	211 70	150 [illegible]	85 [illegible]	[illegible]	[illegible]	[illegible] 40	[illegible]	127 [illegible]	
		[illegible]	John M. [illegible]	112 [illegible]		112 40		112 [illegible]		112 [illegible]			112 [illegible]		
		[illegible]	[illegible] M. [illegible]	[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	210 85	
		County Attorney [illegible]	T. [illegible] M. [illegible]	[illegible] 1		195 1		1 [illegible]		[illegible]		[illegible]	[illegible]		
		[illegible]	[illegible]	[illegible]		[illegible]	[illegible] 1	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]	[illegible] M. [illegible]	1[illegible]	7 00	861 40		85[illegible]		[illegible]		[illegible]	[illegible]		
		[illegible]	[illegible]	[illegible]		42 [illegible]		[illegible]		[illegible]		7 78	[illegible]		
		[illegible]	"	[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	1387 15		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	
		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]	[illegible]	[illegible] 08		44 80		[illegible] 08		[illegible] 00		[illegible]	[illegible]		
		[illegible]		[illegible]		[illegible]	1235 16	[illegible]		[illegible]	[illegible] 16	[illegible] 2	[illegible]	[illegible]	
		[illegible]	[illegible] L. [illegible]	21[illegible]	[illegible]	[illegible]		[illegible]		6 [illegible]			[illegible]		
		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible] 00	[illegible] 59		[illegible]
		[illegible]		[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] 1		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]	S. S. Macdonell, Q.C.	[illegible]											
		[illegible]													
		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]			[illegible]		
		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]			
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]		45 00	576 68		
		County Court Clerk		[illegible]		[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		
		[illegible]		[illegible]		[illegible]	[illegible]	[illegible]	[illegible] 08	[illegible]	[illegible]	[illegible]	[illegible]	977 00	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

es and Emoluments, etc.—*Continued.*

ment.	Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Remarks.
c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
...	919 45	1368 25	919 45	.....	919 45	1368 25	30 90	888 50	1321 35	
00	813 00	.....	791 35	20 00	811 35	.....	100 00	711 35	.....	
...	1351 43	.....	1284 43	40 00	1324 43	.....	241 00	1083 43	.....	
...	358 00	2522 43	324 45	23 00	347 45	2483 23	141 00	206 45	2040 43	
...	2143 70	2143 70	1705 55	387 28	2092 83	2092 83	868 44	1224 39	1275 26	
...	112 50	.....	112 50	.....	112 50	.....	.....	112 50	.....	
...	103 60	216 10	51 10	.....	51 10	163 60	5 25	158 35	210 85	
...	194 13	.....	158 63	.....	158 63	.....	56 50	102 13	.....	
...	695 05	889 18	648 40	.....	648 40	807 03	56 50	591 90	776 18	
00	861 70	.....	857 70	.....	857 70	.....	10 36	847 34	.....	
...	342 60	.....	337 85	.....	337 85	.....	7 78	330 07	.....	
...	191 60	1395 90	191 60	.....	191 60	1387 15	.....	191 60	1377 76	
...	2655 75	2655 75	2443 23	.....	2443 23	2443 23	1386 67	1056 56	1269 08	App'd 6th March, 1884.
...	534 50	534 50	534 50	.....	534 50	534 50	.....	534 50	534 50	
...	43 45	43 45	20 15	.....	20 15	20 15	.....	20 15	43 45	App'd 17th Oct., 1884.
...	544 00	.....	491 00	.....	491 00	.....	27 35	463 65	.....	
...	691 16	1235 16	691 16	.....	691 16	1182 16	14 25	676 91	1193 56	
00	668 08	.....	668 08	.....	668 08	.....	.....	668 08	.....	
...	1026 89	.....	956 89	.....	956 89	.....	70 00	886 89	.....	[as Local Registrar. App'd 17th Oct., 1884,
...	585 86	2280 83	585 86	.....	585 86	2210 83	150 00	435 86	2060 83	
...	4153 16	4153 16	3753 16	.....	3753 16	3753 16	1769 42	1983 74	2383 74	
....	138 50	138 50	138 50	.....	138 50	138 50	.....	138 50	138 50	
ade.	.....	.....	.....	.....	.....	.....	.....	.....	.....	
	.....	.....	.....	.....	.....	.....	.....	.....	.....	
....	234 89	.....	234 89	.....	234 89	.....	.....	234 89	.....	
...	928 95	.....	928 95	.....	928 95	.....	21 20	907 75	.....	
00	575 58	.....	575 58	45 50	621 08	.....	45 00	576 08	.....	
....	536 46	.....	536 46	449 54	986 00	.....	107 79	878 21	.....	
....	250 25	1362 29	250 25	223 00	473 25	2080 33	232 00	241 25	977 50	
....	2207 87	2207 87	2207 87	.....	2207 87	2207 87	480 27	1727 60	1727 60	

SHEDULE shewing Return of Fof

County or District.	County Town.	Office.	Officer.	Amount Earned.	Salary paid by the Governi	...
				$ c.	$	
Halton—*Con*.....	Milton.....	Local Registrar	W. L. P. Eager.....	28 50	600	3'
		County Court Clerk.....	"	262 15	.....	00
		Surrogate Judge	"	364 05	.....	00
						05
Hastings	Belleville.....	Sheriff.....	Wm. Hope.....	5321 71	....	52
		Surrogate Judge.....	Judge Lazier	306 40	.....	25
		Local Master.....	S. S. Lazier	3535 40	.....	96
		Deputy Registrar	"	1625 80	....	60
		County Attorney	Geo. E. Henderson, Q.C.	538 50	* ..	
		Clerk of the Peace.....	"	835 89	* ..	12
		Deputy Clerk of the Crown	A. G. Northrup	743 30	45	00
		County Court Clerk.....	"	1556 70	....	85
		Surrogate Registrar	"	539 17	....	65
						20
Huron	Goderich.....	Sheriff.....	R. Gibbons.....	5754 36	....	94
		Surrogate Judge.....	Judge Toms.....	554 50	....	00
		Local Master and Deputy Registrar	H. McDermott and S. Malcolmson	.....	250	80
		County Attorney.....	Ira Lewis	322 97	....	89
		Clerk of the Peace.....	"	1336 30	....	42
		Deputy Clerk of the Crown	D. McDonald.....	178 00	50	mut
		County Court Clerk.....	"	727 50	...	80
		Surrogate Registrar.....	"	924 46	...	20
Kent.....	Chatham	Sheriff.....	John Mercer.....	4930 54	...	69
		Surrogate Judge	Judge Bell.....	375 00	...	00
		Local Master.....	R. O'Hara.....	976 88	...	97
		Deputy Registrar	"	732 65	...	04
		County Attorney.....	Wm. Douglas.	925 00	...	73
		Clerk of the Peace	"	1492 00	...	50
		Deputy Clerk of the Crown	W. A. Campbell.....	156 50	4	37
		County Court Clerk.....	"	1027 15	...	90
		Surrogate Registrar	"	528 85	...	0
Lambton...	Sarnia	Sheriff.....	Jas. Flintoft.....	4218 83	...	2

SCHEDULE shewing Return of Fees and Emoluments, etc *Continued*

County or District	County Town	Office	Officer	Amount Earned	Salary paid by the Government	Total Earnings and Salary	Total Earnings collected by officer on all his offices	Amount received during present year	Amount received on account of previous years	Total receipts	Total receipts by officer from all his offices	Amount disbursed	Net amount received	Net amount due and received by officer on account of all his offices	Remarks
				$ c	$ c	$ c	$ c	$ c	$ c	$ c	$	$ c	$ c	$ c	
	Kingston	Surrogate Judge	Judge Price	Commuted at		752 00	752 00	752 00		752 00			752 00	752 00	
		Local Master	J. A. Henderson, Q.C.	961 85		961 85		612 22		612 22		151 06	461 16		
		Deputy Registrar		1 [illegible] 27		1 [illegible] 27	1 [illegible] 07	478 05		478 05	1 [illegible] 07	146 16	331 89	1 [illegible] 7	
		County Attorney	B. M. Britton, Q.C.	2 [illegible] 67		2 [illegible] 67		233 92		233 92		200 00	33 92		
		[illegible]		1 [illegible] 80		1 [illegible] 80	1 [illegible] 6	804 90		804 90	1 [illegible] 4	234 80	570 09	685 26	
		[illegible]		1 [illegible] 4	4 [illegible] 0	[illegible] 7		639 7		639 07		166 66	472 41		
		[illegible]		[illegible] 0		[illegible] 0		646 80	9 [illegible]	721 80		187 00	534 80		
		Surrogate Registrar		1 [illegible] 00		1 [illegible] 00	17 [illegible] 7	450 00	32 45	482 45	1826 10	187 00	295 45	1189 11	
	Ontario	[illegible]	C. H. Moore, [illegible]	[illegible] 6		[illegible] 0	[illegible]	5967 50	70 [illegible]	6 [illegible] 64	475 [illegible] 4	250 50	5 [illegible] 54	5 [illegible]	
		[illegible] Judge	Judge McPherson,	2 [illegible] 50		[illegible] 0	[illegible] 0	234 50		234 50	[illegible] 4 [illegible] 0		234 50	234 50	
		Local Master	[illegible] Master	[illegible] 0		4 [illegible] 0		484 47		484 45			484 45		Local Master at [illegible]
		Deputy Registrar		2 [illegible] 0		[illegible] 0	[illegible] 0	1 [illegible] 50		122 40	[illegible] 0		122 4	30 [illegible]	[illegible] Master at [illegible]
		County Attorney	W. H. Biggar	1 [illegible] 0		7 [illegible] 0	1 [illegible] 0	111 50	20 80	1 [illegible] 0	1 [illegible] 0	30 00	1 [illegible] 80	121 50	[illegible]
		[illegible]	W. A. Armstrong	1 [illegible] 0		[illegible] 2	[illegible] 2	1 [illegible] 0	32 [illegible]	1 [illegible] 0	1 [illegible] 0		1 [illegible] 4	1 [illegible] 62	
		[illegible]		[illegible] 0	[illegible] 0 8			[illegible]		[illegible] 0		[illegible]	[illegible] 10		
		County Court Clerk...		8 [illegible] 0		[illegible] 3		80 [illegible] 2		80 [illegible] 2		7 80	72 [illegible] 8		
		[illegible]		1 [illegible] 0		[illegible] 0	202 [illegible] 70	4 [illegible] 0	32 00	1 [illegible] 0	1 [illegible] 00	41 70	1 [illegible] 0	1916 80	
	[illegible]	[illegible]	[illegible] H. [illegible]	2 [illegible] 18		2 [illegible] 1	[illegible] 0	2271 40	21 [illegible] 1	2 [illegible] 61	[illegible] 6	66 [illegible]	2 [illegible] 96	1 [illegible] 1	
		Surrogate Judge	[illegible]	1 [illegible] 0		[illegible] 0	1 [illegible] 0	154 50		1 [illegible] 0	1 [illegible] 0		1 [illegible] 50	1 [illegible] 0	
		[illegible]	[illegible]	6 [illegible] 50		47 00	47 00	47 00		47 00	47 00	71	46 [illegible] 6	46	
		[illegible]	J. R. Martin	2 [illegible] 60		[illegible] 0		91 [illegible]	1 [illegible] 08	2 [illegible] 4		8 80	2 [illegible] 6 4		
		[illegible]		9 [illegible] 61		[illegible] 61	[illegible] 2	97 [illegible] 61		97 [illegible]	1 [illegible] 61	2 [illegible] 06	2 [illegible] 61	90 [illegible] 61	
		[illegible]	[illegible] Master	42 50	68 08	4 [illegible] 50		58 [illegible] 2		68 [illegible] 50			462 20		
		County Court Clerk		[illegible] 7		[illegible] 7		880		[illegible] 8		6 [illegible] 0	[illegible] 8		
		[illegible]		7 [illegible] 6		7 [illegible] 6	114 [illegible] 17	76 [illegible] 40		7 [illegible] 6	142 [illegible] 28	9 [illegible] 96	46 [illegible] 46	142 [illegible] 17	
	Lindsay	[illegible]	Master [illegible]	7 [illegible] 0		6 [illegible] 77	1 [illegible] 7	4 [illegible] 0	1 [illegible] 7	1 [illegible] 0	[illegible] 11	[illegible] 0	1 [illegible] 0	1 [illegible] 27	
		[illegible]	[illegible] Master	[illegible] 0		11 [illegible] 00		4 [illegible] 00		4 [illegible] 00			4 [illegible] 00		
		Local Master		1 [illegible] 0		[illegible] 0		111 92		4 [illegible] 2	[illegible] 0		1 [illegible] 12	48 [illegible] 0	
		County Attorney	[illegible]	[illegible] 0		[illegible] 0		440 [illegible]		440 00		[illegible] 0	42 [illegible] 0		
		[illegible]		7 [illegible] 2		[illegible] 0	1 [illegible] 0	781 [illegible] 28	28 [illegible]	810 11	1 [illegible] 14	[illegible] 0	80 04	1 [illegible] 2 [illegible] 74	

SCHEDULE shewing Return of Fees and Emoluments, etc.—*Continued*

County or District	County Town	Office	Officers	Amount Claimed	Salary paid by the Government	Total Earnings and Salary	Total Earnings and Salary (by all the officers in the office)	Amount to pay Office Rent per year	Amount Rent of Office per week days	Total receipts	Total fees (by direction) all the officers	Amount fees Taxed	Net amount received	Net amount due (or received by) other officers of the office	Remarks
				$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
Halton—Con.	Milton	Local Registrar	W L P Fraser	[illegible] 0	600 00	628 50		628 50		628 50		120 00	508 50		
		County Court Clerk	"	262 15		262 15		262 15		262 15		120 00	142 15		
		Surrogate Judge	"	364 05		364 05	1254 70	364 05		364 05	1254 70	120 00	244 05	891 70	
Hastings	Belleville	Sheriff	Wm. Hope	5321 71		5321 71	5321 71	4571 53	645 18	5216 71	5216 51	1753 12	3463 59	3762 53	
		Surrogate Judge	Judge Lazier	306 40		306 40	306 40	306 40		306 40	306 40		306 40	306 40	
		Local Master	S S Lazier	3535 40		3535 40		3494 00		3494 00		349 50	3144 50		
		Deputy Registrar	"	1623 80		1623 80	4161 20	1638 40		1638 40	5030 40	343 50	1294 90	4468 20	
		County Attorney	G. L. Henderson, Q.C.	538 50		538 50		538 50		538 50		100 00	438 50		Appointed May 28
		Crown Attorney	"	835 80		835 80	1374 30	836 80		836 80	1374 30	250 00	585 80	1024 30	
		Deputy Clerk of the Crown	A. G. Northrup	744 30	471 00	1215 30		844 30	200 00	1044 30		20 00	1024 30		
		County Court Clerk	"	1156 70		1156 70		856 70	300 00	1156 70		220 00	1136 70		
		Surrogate Registrar	"	689 17		689 17	3289 17	389 17	200 00	589 17	2989 17	220 00	369 17	2829 17	
Huron	Goderich	Sheriff	R. Crombie	5754 86		5754 86	5754 86	5067 46		5067 46	5067 46	3686 87	2270 01	2067 43	
		Surrogate Judge	Judge Toms	554 50		554 50	604 50	604 50		554 50	554 50		554 50	604 50	
		Local Master and Deputy Registrar	H. M. Dorcas and I. S. Mackenzie		2500 00		2500 00	2500 00		2500 00	2500 00	16 00	2490 00	2490 00	
		County Attorney	Ira Lewis	322 97		322 97		322 97		322 97		22 97	300 00		
		Crown Attorney	"	1336 30		1336 30	1679 27	1536 30		1336 30	1659 27	225 00	811 30	1111 80	
		Deputy Clerk of the Crown	D. McDonald	178 00	500 00	678 00		678 00		678 00		7 50	670 50		
		County Court Clerk	"	727 50		727 50		727 50		727 50		37 50	690 00		
		Surrogate Registrar		924 46		924 46	2829 96	924 46		924 46	2829 96	15 00	909 46	2229 96	
Kent	Chatham	Sheriff	[illegible] Mercer	4360 54		4360 54	4360 54	4200 10	1527 58	5727 68	[illegible] 48	1804 88	3560 63	2965 09	
		Surrogate Judge	Judge Bell	375 00		375 00	375 00	375 00		375 00	375 00		375 00	375 00	
		Local Master	R. C. Hare	956 88		956 88		920 16	17 88	938 24			938 24		
		Deputy Registrar	"	752 67		752 67	1781 53	690 12	13 28	703 40	1641 64	20 00	683 40	1689 53	
		County Attorney	Wm. Douglas	925 00		925 00		925 00		925 00		25 00	900 00		
		Crown Attorney	"	1492 00		1492 00	2417 00	1340 00		1340 00	2265 00	250 00	1090 00	2142 00	
		[illegible]	W. A. Campbell	1 [illegible]	4 00	[illegible]		[illegible]		[illegible]		4 45	691 55		
		[illegible]		1037 10		1037 10		911 50	86 08	997 50		375 00	622 50		
		Surrogate Registrar	"	728 80		728 80	2162 50	670 00	54 00	670 00	2134 00	30 00	640 00	1752 60	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1241 19	[illegible]	

ees and Emoluments, etc.—*Continued.*

ment.	Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received from previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Remarks.
c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
00	628 50	.....	628 50	.....	628 50	.....	120 00	508 50	.....	
...	262 15	.....	262 15	.....	262 15	.....	120 00	142 15	.....	
...	364 05	1254 70	364 05	.....	364 05	1254 70	120 00	244 05	894 70	
...	5321 71	5321 71	4571 33	645 18	5216 51	5216 51	1559 12	3657 39	3762 59	
...	306 40	306 40	306 40	.....	306 40	306 40	.....	306 40	306 40	
...	3535 40	.....	3494 00	.....	3494 00	.....	349 50	3144 50	.....	
....	1625 80	5161 20	1536 40	.....	1536 40	5030 40	343 50	1192 90	4468 20	
....	538 50	.....	538 50	.....	538 50	.....	100 00	438 50	.....	App'd 13th May, 1884.
....	835 89	1374 39	835 89	.....	835 89	1374 39	250 00	585 89	1024 39	
) 00	1193 30	.....	843 30	200 00	1043 30	.....	20 00	1023 30	.....	
....	1556 70	.....	856 70	500 00	1356 70	.....	220 00	1136 70	.....	
....	539 17	3289 17	389 17	200 00	589 17	2989 17	220 00	369 17	2829 17	
....	5754 36	5754 36	5357 38	.....	5357 38	5357 38	3086 87	2270 51	2667 49	
....	554 50	554 50	554 50	.....	554 50	554 50	.....	554 50	554 50	
0 00	.....	2500 00	2500 00	.....	2500 00	2500 00	10 00	2490 00	2490 00	
....	322 97	.....	322 97	.....	322 97	.....	22 97	300 00	.....	
.....	1336 30	1659 27	1336 30	.....	1336 30	1659 27	525 00	811 30	1111 30	
0 00	678 00	....	678 00	.....	678 00	.....	7 50	670 50	.....	
....	727 50	.....	727 50	.....	727 50	.....	37 50	690 00	.....	
....	924 46	2329 96	924 46	.....	924 46	2329 96	15 00	909 46	2269 96	
.....	4930 54	4930 54	4200 10	1325 38	5525 48	5525 48	1994 85	3530 63	2935 69	
.....	375 00	375 00	375 00	.....	375 00	375 00	.....	375 00	375 00	
.....	976 88	.....	920 36	17 88	938 24	.....	.....	938 24	.....	
.....	732 65	1709 53	690 12	13 28	703 40	1641 64	20 00	683 40	1689 53	
.....	925 00	.....	925 00	.....	925 00	....	25 00	900 00	.....	
.....	1492 00	2417 00	1340 00	.....	1340 00	2265 00	250 00	1090 00	2142 00	
50 00	606 50	.....	606 50	.....	606 50	.....	4 45	601 05	.....	
.....	1027 15	.....	911 50	86 00	997 50	.....	375 00	622 50	.....	
.....	528 85	2162 50	496 00	34 00	530 00	2134 00	30 45	499 55	1752 60	
.....	4218 83	4218 83	1450 61	1395 58	2846 19	2846 19	1605 00	1241 19	2613 83	

SCHEDULE shewing Return of

COUNTY OR DISTRICT	COUNTY TOWN.	OFFICE.	OFFICER.	Amount Earned.
				$ c.
Perth	Stratford	Sheriff	John Hossie	4774 13
		Surrogate Judge	Judge Lizars	487 00
		Local Master	"	820 90
		County Attorney	John Idington, Q.C.	629 05
		Clerk of the Peace	"	733 52
		Local Registrar	Jas. Macfadden	390 25
		County Court Clerk	"	1150 96
		Surrogate Registrar	"	650 60
Peterboro'	Peterboro'	Sheriff	James A. Hall	2138 12
		Surrogate Judge	Judge Dennistoun	226 00
		Local Master	C. A. Weller	871 85
		Deputy Registrar	"	466 65
		County Attorney	"	242 20
		Clerk of the Peace	"	680 94
		Deputy Clerk of the Crown	John Moloney	28 00
		County Court Clerk	"	549 80
		Surrogate Registrar	"	330 89
Prescott & Russell	L'Original	Sheriff	J. D. Merrick	2934 42
		Surrogate Judge	Judge Daniell	commut
		Local Master	"	100 80
		County Attorney	John Maxwell	169 20
		Clerk of the Peace	"	640 69
		Local Master	John Fraser	253 00
		County Court Clerk	"	287 9
		Surrogate Registrar	"	144 0
Prince Edward	Picton	Sheriff	James Gillespie	2464 7
		Surrogate Judge	Judge Jellett	133 5
		Local Master	"	121 3
		"	S. S. Lazier.	360 9
		Deputy Registrar	"	32 0
		County Attorney	Philip Low, Q.C.	204 2

SCHEDULE shewing Return of Fees and Emoluments, etc. *Continued*

County or District	County Town	Office	Officer	Amount Earned	Salary paid by the Government	Total Emoluments and Salary	Total Fees received and Salary paid to the Officer	Amount fees retained by Officer	Amount fees collected during year	Total receipts	Total receipts paid over to the Treasurer	Amount due	Net Emolument received	Net amount due to the Government for fees collected by Officer during the year	Remarks
				$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
[illegible]	Sarnia	Surrogate Judge	Judge Robinson	216 00		216 00		216 00		216 00			216 00		
		Local Master	"	284 80		284 80	500 80	284 80	32 43	317 23	532 92		317 23	500 80	
		County Attorney	J. P. [illegible]	444 56		444 56		441 52	102 12	543 64			543 64		
		Clerk of the Peace	"	1157 20		1157 20	1501 52	1157 20	346 17	1503 37	2061 [illegible]	1 97	1501 42	1759 [illegible]	
		Local Registrar	W. R. [illegible]	149 60	675 00	824 60		824 60		824 60		25 00	799 [illegible]		
		County Court Clerk	"	780 69		780 69		780 69		780 69		20 00	760 69		
		Surrogate Registrar	"	471 07		471 07	2065 24	451 05		451 05	2065 24	10 00	441 05	2016 24	
[illegible]	Perth	Sheriff	[illegible] Thompson	1486 63		1486 63	1458 6	1447 81	310 83	1758 14	1768 14	402 61	1275 [illegible]	994 42	
		Surrogate Judge	Judge Sinclair	167 50		167 50		167 50		167 50			167 50		
		Local Master	"	105 70		105 70	272 50	105 70	71 50	177 20	344 70		177 20	273 20	
		County Attorney	E. G. Malloch	174 37		174 37		138 37	20 00	158 37		8 00	150 37		
		Clerk of the Peace	"	401 92		401 92	651 [illegible]	449 46	336 67	786 13	744 80	25 00	761 13	633 29	
		Local Registrar	Charles [illegible]	64 16	675 00	739 16		730 16	1 00	731 16		7 86	673 30		
		County Court Clerk	"	319 86		319 86		341 [illegible]	88 60	430 [illegible]		1 [illegible]	430 17		
		Surrogate Registrar	"	48 54		48 54	1377 56	[illegible]	62 54	[illegible]	1445 01	15	2[illegible]	1382 87	
[illegible]	Brockville	Sheriff	Thomas Stuart	2[illegible]		2[illegible]	2720 [illegible]	[illegible]		[illegible]	2 [illegible]	1056 74	1510 11	1610 11	Appointed 4th Dec. 1884
		Surrogate Registrar	Judge Macdonald	[illegible] Eliot		480 00	480 00	480 00		480 00	480 00		480 00	480 00	
		Local Master	J. D. [illegible]	204 [illegible]		204 [illegible]		176 42		176 42			176 42		
		Deputy Registrar	"	2[illegible]		2[illegible]		118 00		118 00			118 00		
		County Attorney	"	184 76		184 [illegible]		179 76		179 76		11 52	168 24		
		Clerk of the Peace	"	773 77		773 77	1429 05	710 45		710 [illegible]	1184 [illegible]	34 86	675 02	1488 20	
		Deputy Clerk of the Crown	S. Reynolds	127 29	500 00	627 29		627 29		627 29		5 00	622 29		
		County Court Clerk	"	160 11		160 11		160 11		160 11		10 00	150 11		
		Surrogate Registrar	"	105 20		105 20	1367 60	105 20		105 20	1367 60	[illegible]	400 20	1272 60	
[illegible]	Napanee	Sheriff	C. F. Brown	2820 70		2820 70	2320 70	1730 01	1[illegible] 84	2189 [illegible]	2501 [illegible]	1312 11	1087 82	1068 50	
		Surrogate Judge	Judge Wilkinson	264 00		264 00	264 00	264 00		264 00	264 00		264 00	264 00	
		Local Master	S. S. Lazier	305 00		305 00		305 00		305 00		16 00	241 00		
		Deputy Registrar	"	79 30		79 30	384 80	79 30		79 30	384 80	20 65	58 65	284 65	
		County Attorney	A. L. Morden	68 00		68 00		68 00		68 00		8 00	60 00		
		Clerk of the Peace	"	699 70		699 70	767 70	493 40		493 40	761 40	56 86	636 54	699 90	
		Deputy Clerk of the Crown	J. L. Morden	103 [illegible]	400 00	[illegible]		503 52		503 52			503 52		

SCHEDULE showing Return of Fees and Emoluments, etc.—*Continued.*

County or District	County Town	Office	Officer	Amount Fixed	Salary paid by the Crown	Total Earnings and Salary	Total Earnings and Salary all other sources	Amount retained for per cent.	Amount retained for Salary	Total receipts	Total receipts by officer for all services	Amount disbursed	Net amount received	Net amount due by officer to the Crown	Remarks
				$ c	$ c	$ c	$ c	$ c	$ c	$	$	$	$ c	$	
[illegible] and Al[illegible]	Nipissing	County Court Clerk	J. P. Mason	318 13		318 13		281 71		281 71		75	206 96		
		Surrogate Registrar	"	205 84		205 84	1025 00	161 25		161 25	946 78	1 30	160 25	1023 45	
[illegible]	St. Catharines	Sheriff	John A. Woodruff	3191 84		3191 84	3191 84	2538 06	737 77	3275 83	3275 83	1234 27	2041 56	1977 57	
		Surrogate Judge	Judge Scoble	600 00 at		566 00	466 00	566 00		566 00	766 00		566 00	566 00	
		Local Master	J. W. McDonald	711 58		711 58		579 58		579 58		12 00	567 58		
		Deputy Registrar	"	910 00		210 00	921 56	177 80		177 80	767 38		177 80	909 56	
		County Attorney	John McKeown	457 50		457 50		457 50		457 50			457 50		
		Clerk of the Peace		141 74		1419 74	1877 24	1419 74		1419 74	1877 24	144 00	127 08	1772 58	
		Deputy Clerk of the Crown	J. Clench	129 20	450 00	579 20		579 20		579 20		5 00	574 20		
		County Court Clerk		736 28		736 28	...	691 03		691 03		17 50	673 53		
		Surrogate Registrar	"	479 70		479 70	1755 18	479 40		479 40	1749 63	23 15	456 27	1749 75	
[illegible]	London	Sheriff	William Glass	6454 23		6454 23	6454 23	5121 40	377 82	5499 22	5499 22	3610 00	1889 22	2844 23	
		Surrogate Judge	Judge Elliott	commuted at		925 00	925 00	925 00		925 00	925 00		925 00	925 00	
		Local Master	James Shanly	1940 80		1940 80		1392 04		1392 04		102 75	1290 19		
		Deputy Registrar	"	799 [illegible]		799 [illegible]	2686 24	731 85		731 85	2124 23	343 88	387 47	2239 61	
		County Attorney	Chas. Hutchinson	2228 92		2228 92		2062 44		2062 44		252 89	1809 55		
		Clerk of the Peace	"	2274 12		2274 12	4593 04	2161 75		2161 75	4224 19	218 24	1943 51	4031 91	
		Deputy Clerk of the Crown	John Macbeth	603 30	500 00	1103 30		1103 30		1103 30		10 00	1093 30		
		County Court Clerk.....	"	2679 65		2679 65		2778 65	30 00	2608 65		860 00	1748 65		
		Surrogate Registrar	"	1354 [illegible]		1354 50	5117 45	1354 50		1354 50	966 45	320 00	1034 50	4927 45	
Norfolk	Simcoe	Sheriff	E. Dowdes	3305 59		3305 59	3305 59	3124 11	666 57	3790 68	3790 68	1315 93	2474 76	1989 67	
		Surrogate Judge	Judge McMahon	285 00		285 00	285 00	285 00		285 00	285 00		285 00	285 00	
		County Attorney	J. H. Ansley	132 80		132 80		120 80		120 80		15 93	104 87		
		Clerk of the Peace	"	731 09		731 09	863 89	720 46		720 46	841 26	87 25	633 21	810 71	
		Local Master	C. C. Ridout	284 74		284 74		237 41		237 41			237 41		
		Local Registrar	"	34 00	675 00	709 00		709 00		709 00			709 00		
		County Court Clerk	"	595 51		595 51		563 65		563 65		23 75	539 90		
		Surrogate Registrar	"	524 27		524 27	2113 50	488 85		488 85	1948 91		488 85	2089 77	
Northumberland & Durham	Cobourg	Sheriff	T. O. Proctor	4540 48 *		4540 48	4540 48	3248 04		3248 04	3248 04	2133 96	1115 08	2412 52	Appd March 7 1884
		Surrogate Judge	Judge Clark	commuted at		600 00		600 00		600 00			600 00		

es and Emoluments, etc.—*Continued.*

ment.	Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Remarks.
c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
...	318 13	.....	281 71	.....	281 71	.....	75	280 96	.....	
...	203 85	1025 50	161 55	.....	161 55	946 78	1 30	160 25	1023 45	
...	3191 84	3191 84	2538 06	737 77	3275 83	3275 83	1234 27	2041 56	1957 57	
	566 00	566 00	566 00	.....	566 00	566 00	....	566 00	566 00	
...	711 56	.....	579 58	.....	579 58	.....	12 00	567 58	....	
...	210 00	921 56	177 80	.....	177 80	757 38	.....	177 80	909 56	
...	457 50	.....	457 50	.....	457 50	.....	.....	457 50	.....	
...	1419 74	1877 24	1419 74	.....	1419 74	1877 24	144 66	1275 08	1732 58	
00	579 20	.....	579 20	.....	579 20	....	5 00	574 20	.....	
...	736 28	.....	691 03	.....	691 03	.....	17 50	673 53	.....	
...	479 70	1795 18	479 40	.....	479 40	1749 63	23 13	456 27	1749 55	
....	6454 23	6454 23	5121 40	377 82	5499 22	5499 22	3610 00	1889 22	2844 23	
	925 00	925 00	925 00	.....	925 00	925 00	.....	925 00	925 00	
....	1946 89	.....	1392 94	.....	1392 94	.....	102 75	1290 19	.....	
....	739 35	2686 24	731 35	.....	731 35	2124 29	343 88	387 47	2239 61	
....	2228 92	.....	2062 44	.....	2062 44	.....	252 89	1809 55	.....	
. ..	2274 12	4503 04	2161 75	.....	2161 75	4224 19	218 24	1943 51	4031 91	
00	1103 30	.....	1103 30	.....	1103 30	.....	10 00	1093 30	.....	
....	2659 65	.....	2578 65	30 00	2608 65	.....	860 00	1748 65	.....	
....	1354 50	5117 45	1354 50	.....	1354 50	5066 45	320 00	1034 50	3927 45	
....	3305 59	3305 59	3124 11	666 57	3790 68	3790 68	1315 92	2474 76	1989 67	
....	285 00	285 00	285 00	.....	285 00	285 00	.....	285 00	285 00	
....	132 80	.....	120 80	.....	120 80	.....	15 93	104 87	.....	
....	731 09	863 89	720 46	.....	720 46	841 26	37 25	683 21	810 71	
....	284 74	.....	237 41	.....	237 41	.....	.....	237 41	.....	
5 00	709 00	.....	709 00	.....	709 00	.....	.....	709 00	.....	
....	595 51	.....	563 65	.....	563 65	.....	23 75	539 90	.....	
....	524 25	2113 50	488 85	.....	488 85	1998 91	.....	488 85	2089 75	
....	4546 48	4546 48	3248 04	.....	3248 04	3248 04	2133 96	1115 08	2412 52	App'd March 7, 1884.
.	600 00	.....	600 00	....	600 00	.....	.....	600 00	.....	

SCHEDULE shewing Return of

COUNTY OR DISTRICT	COUNTY TOWN.	OFFICE.	OFFICER.	Amount Earned. $ c.
Perth	Stratford	Sheriff	John Hossie	4774 13
		Surrogate Judge	Judge Lizars	487 00
		Local Master	"	820 90
		County Attorney	John Idington, Q.C.	629 05
		Clerk of the Peace	"	733 52
		Local Registrar	Jas. Macfadden	390 25
		County Court Clerk	"	1150 96
		Surrogate Registrar	"	650 60
Peterboro'	Peterboro'	Sheriff	James A. Hall	2138 12
		Surrogate Judge	Judge Dennistoun	226 00
		Local Master	C. A. Weller	871 85
		Deputy Registrar	"	466 65
		County Attorney	"	242 20
		Clerk of the Peace	"	680 94
		Deputy Clerk of the Crown	John Moloney	28 00
		County Court Clerk	"	549 80
		Surrogate Registrar	"	330 89
Prescott & Russell	L'Original	Sheriff	J. D. Merrick	2934 42
		Surrogate Judge	Judge Daniell	commut
		Local Master	"	100 80
		County Attorney	John Maxwell	169 20
		Clerk of the Peace	"	640 69
		Local Master	John Fraser	253 00
		County Court Clerk	"	287 95
		Surrogate Registrar	"	144 04
Prince Edward	Picton	Sheriff	James Gillespie	2464 7
		Surrogate Judge	Judge Jellett	133 5
		Local Master	"	121 3
		"	S. S. Lazier	360 9
		Deputy Registrar	"	32 0
		County Attorney	Philip Low, Q.C.	204 2

SCHEDULE Shewing Return of Fees and Emoluments, etc.—*Continued*

County or District	Christian Names	Office	Officer	Amount Earned	Amount paid by Government	Total Earnings	Total Earnings and Salary, all collected in the year	Amount retained	Amount retained and paid over to Treasurer	Total received	Total received by the Officer	Amount paid Deputy	Net amount received	Amount retained by the Officer to cover Salary, Office Rent, Clerk hire, and other charges	Remarks
				$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
[illegible]	Charles	Local Master	Lodge Clerk	1240 00		1240 00	1800 00	1240 00		1240 00	1800 00	60 00	941 33	1 50 67	
		County Attorney	J W Kerr	472 10		477 10		422 10		422 10		80 00	322 10		
		Crown Land Agent	[illegible]	960 00		960 00	1473 40	960 00		960 00	1418 40	80 00	796 00	1173 40	
		Local Registrar	R D Chadderton	165 00	775 00	940 00		940 00		940 00		150 00	781 00		
		County Court Clerk	"	867 00		867 00		800 00		800 00		750 00			
		Surrogate Registrar	"	990 00		1260 00	2282 00	1260 00		1260 00	2015 10	120 00	774 00	1277 00	
[illegible]	Wentworth	Sheriff	Thomas Paxton	1227 00		1827 75	5827 75	1827 75		4537 24	4537 24	240 80	1296 95	542 95	
		Surrogate Judge	Lodge Lawrence	Gratuitous		540 00	540 00	540 00		40 00	40 00		500 00	500 00	
		Local Master	Lodge Darby	1000 85		1000 85	1000 85	1000 85		1000 85	1000 85	40 00	960 85	960 85	
		County Attorney	J J Lawrence	863 56		863 56	1274 16	1274 16		674 16		189 55	484 61		
		Crown Land Agent	"	1311 76		1311 76	2127 40	1084 70		1084 70	1711 10	801 00	720 70	1633 09	
		Local Registrar	L T Lawrence	1800 80	675 00	2475 80		854 60		854 60		140 00	814 60		
		County Court Clerk		801 70		801 70		802 25		782 25		80 00	702 25		
		Surrogate Registrar		794 80		794 80	2471 80	784 08		784 08	2240 80	80 00	704 08	2401 80	
[illegible]	Wentworth	Sheriff	George Perry	2880 80		2880 80	2880 80	1926 29	715 00	2641 29	2641 29	1241 00	1125 29	1665 00	
		Surrogate Judge	Lodge McQueen	500 80		500 80	500 80	500 50		500 50	500 50		500 50	500 50	
		Local Master	H B Lawson	479 00		479 00		476 26		476 26		4 00	472 26		
		Crown Land Agent		1908 80		1908 80	970 10	482 60		482 60	938 80		482 60	906 10	
		County Attorney	F B Lawson	187 00		187 00		187 30		187 30		10 00	177 30		
		County Court Clerk		719 67		719 67	906 97	719 67		719 67	906 97		719 67	906 97	
		Registrar Crown Lands and Surrogate	Lucas Crysdale	1801 20	140 00	1941 20		801 20	71 00	872 20		72 00	800 20		
		County Court Clerk		918 56		918 56		918 56	140 00	1058 56		80 00	1057 86		
		Surrogate Registrar		960 00		960 00	2764 16	804 16	115 21	947 37	2804 16	87 00	919 62	2670 42	
[illegible]	Lincoln	Sheriff	Robt Temple	2242 40		2242 40	2242 40	1683 26	60 80	2056 15	2056 15	111 41	940 34	1116 59	
		Surrogate Judge	Lodge Scott	Gratuitous		840 00		840 00		840 00			840 00		
		Local Master		526 80		526 80	966 00	963 40	78 80	242 20	452 20	20 00	222 20	436 00	
		County Attorney	W H McDougall	80 80		80 80		80 80		80 80		20 00	60 80		
		County Court Clerk		744 80		664 80	685 65	749 74		749 74	907 74	70 00	679 74	837 74	
		Registrar	A A [illegible]	2040 00	600 00	2640 00		800 00		800 00		120 00	680 00		
		County Court Clerk		287 80		287 80		279 40	24 70	304 10		20 00	284 10		
		Surrogate Registrar		423 08		423 08	1246 08	123 08	75	423 08	1727 75	80 00	343 08	1449 08	

[illegible]

SCHEDULE shewing Return of Fees and Emoluments, etc.—*Continued*

County or District	County Town	Office	Officers	Amount Earned	Salary Paid by the Government	Total Earnings and Salary	Total Earnings and Salary by Officer on all his offices	Amount Salary fixed for present year	Amount drawn in Deputy Fees	Total Receipts	Total Receipts by Officer from all his offices	Amount Fees Lapsed	Net Amount received	Net Amount the Receipts received by Officer on all his offices	Remarks
				$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$	$	
Perth	Stratford	Sheriff	John Hoodie	4774 13		4774 13	4774 13	3963 87	646 15	4432 02	4432 02	1711 82	2720 70	3062 81	
		Surrogate Judge	Judge Lizars	487 08		487 08		487 08		487 08			487 08		
		Local Master	"	820 90		820 90	1307 90	820 90		820 90	1307 90		820 90	1307 90	
		County Attorney	John Idington, Q.C.	629 05		629 05		417 70	197 20	614 90		22 50	592 40		
		Clerk of the Peace	"	753 52		753 52	1962 37	421 41	310 11	731 52	1546 47	242 00	489 52	1058 47	
		Local Registrar	Lus Macfadden	890 25	675 00	1065 25		1065 25		1065 25		140 00	925 25		
		County Court Clerk	"	1150 00		1150 00		1150 00		1150 00		170 00	1000 00		
		Surrogate Registrar		650 01		650 01	2886 81	650 01		650 01	2886 81	140 00	510 01	2246 81	
Peterboro	Peterboro	Sheriff	James A. Hall	2138 12		2138 12	2138 12	1827 60	107 82	1935 01	1935 01	26 87	1908 14	1811 27	
		Surrogate Judge	Judge Dennistoun	226 00		226 00	226 00	226 00		226 00	226 00		226 00	226 00	
		Local Master	C. A. Weller	871 85		871 85		871 85		871 85			871 85		
		Deputy Registrar	"	466 60		466 60		466 60		466 60			466 60		
		County Attorney	"	242 20		242 20		242 20		242 20		1 00	241 20		
		Clerk of the Peace	"	880 24	2261 04	670 24		670 24		670 24	2261 04	60	671 24	2261 04	
		Deputy Clerk of the Crown	John Mahoney	478 00	450 00	478 00		478 00		478 00			478 00		
		County Court Clerk	"	549 80		549 80		470 70		470 70		5 00	465 70		
		Surrogate Registrar		630 80	1658 16	630 80		630 80		630 80	1788 96		630 80	1788 96	
Lincoln & Welland	Welland	Sheriff	J. D. Merritt	2434 43		2434 43	2434 43	2065 85	240 58	2306 43	2306 43	1061 16	1245 27	1883 26	
		Surrogate Judge	Judge Daniel	120 00		120 00		120 00		120 00			120 00		
		Local Master	"	100 83		100 83	221 80	47 50	12 00	59 50	171 50		59 50	220 83	
		County Attorney	John Maxwell	169 20		169 20		114 20		114 20		22 00	92 20		
		Clerk of the Peace	"	640		640 00	809 80	238 00		638 00	759 20	20 00	618 00	739 20	
		Local Master	John Fraser	928 00	675 00	928 00		928 00	63 50	991 50		184 00	811 50		
		County Court Clerk	"	287 00		287 00		202 00		202 00		13 00	202 00		
		Surrogate Registrar	"	144 04	1458 00	144 04		144 04		144 04	1458 40	15 00	99 04	1674 90	
Prince Edward	Picton	Sheriff	James Bleecker	2464 73		2464 73	2464 73	2004 10	660 16	2664 26	2664 26	1647 14	1029 12	837 91	
		Surrogate Judge	Judge Jarratt	143 50		143 50		143 50		143 50			143 50		
		Local Master		121 57		121 57	351 87	92 11		92 11	221 61	41 50	80 61	262 37	Apr. 14th, Acc. [illegible]
		"	S. S. Lazier	360 80		360 80		248 30		248 30		92 00	156 30		less [illegible]
		Deputy Registrar	"	82 05		82 05	382 05	82 05		82 05	282 55	11 00	71 05	282 97	
		County Attorney	Public Law, Q.C.	204 22		204 22		202 22		202 22		11 00	191 22		

Fees and Emoluments, etc.—*Continued.*

Salary paid by the Government.	Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous years.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Remarks.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
.....	4774 13	4774 13	3655 87	646 15	4302 02	4302 02	1711 32	2590 70	3062 81	
.....	487 00	.....	487 00	.....	487 00	.....	.....	487 00	.....	
.....	820 90	1307 90	820 90	.....	820 90	1307 90	.....	820 90	1307 90	
.....	629 05	.....	417 75	197 20	614 95	.....	22 50	592 45	.....	
.....	733 52	1362 57	421 41	310 11	731 52	1346 47	242 00	489 52	1098 07	
675 00	1065 25	.....	1065 25	.....	1065 25	.....	150 00	915 25	.....	
.....	1150 96	.....	1150 96	.....	1150 96	.....	150 00	1000 96	.....	
.....	650 60	2866 81	650 60	.....	650 60	2866 81	150 00	500 60	2416 81	
.....	2138 12	2138 12	1827 69	107 32	1935 01	1935 01	326 85	1608 16	1811 27	
.....	226 00	226 00	226 00	.....	226 00	226 00	.....	226 00	226 00	
.....	871 85	.....	871 85	.....	871 85	.....	.....	871 85	.....	
.....	466 65	.....	466 65	.....	466 65	.....	.....	466 65	.....	
.....	242 20	.....	242 20	.....	242 20	.....	13 00	229 20	....	
.....	680 94	2261 64	676 24	.....	676 24	2256 94	5 00	671 24	2243 64	
450 00	478 00	.....	478 00	.....	478 00	.....	.....	478 00	.....	
.....	549 80	.....	470 70	.....	470 70	.....	5 00	465 70	.....	
.....	330 89	1358 69	330 89	.....	330 89	1279 59	.....	330 89	1353 69	
.....	2034 42	2934 42	2696 81	299 38	2996 19	2996 19	1051 16	1945 03	1883 26	
d at.	120 00	.....	120 00	.....	120 00	.....	.....	120 00	.....	
.....	100 80	220 80	47 60	12 00	59 60	179 60	.....	59 60	220 80	
....	169 20	.....	114 20	.....	114 20	.....	22 00	92 20	.....	
.....	640 69	809 89	638 00	.....	638 00	752 20	20 00	618 00	767 89	
675 00	928 00	.....	928 00	63 50	991 50	.....	180 00	811 50	.....	
.....	287 95	.....	262 95	.....	262 95	.....	60 00	202 95	.....	
.....	144 04	1359 99	144 04	.....	144 04	1398 49	45 00	99 04	1074 99	
.....	2464 73	2464 73	2004 10	669 16	2673 26	2673 26	1647 14	1026 12	817 59	
.....	133 50	.....	133 50	.....	133 50	.....	.....	133 50	.....	
*	121 37	254 87	92 11	.....	92 11	225 61	2 50	89 61	252 37	App'd 14th Aug., 1884.
.....	360 90	.....	248 30	.....	248 30	.....	92 00	156 30	.....	Resigned.
.....	32 05	392 95	32 05	.....	32 05	280 35	11 00	21 05	289 95	"
.....	204 22	.....	202 22	.....	202 22	.....	11 00	191 22	.....	

SCHEDULE shewing Return of Fees

COUNTY or DISTRICT.	COUNTY TOWN.	OFFICE.	OFFICER.	Amount Earned.	Salary paid by the Government.
				$ c.	$ c.
Thunder Bay-*Con.*	Port Arthur....	Surrogate Judge.....	Judge Hamilton.....		
		Local Master.....	"		
		County Attorney	A. R. Lewis.....		
		Clerk of the Peace.....	"	No returns yet	
		Local Registrar	C. Kreissmann.....		
		District Court Clerk.....	"		
		Surrogate Registrar	"		
Victoria.....	Lindsay	Sheriff.....	George Kempt.....	2949 79	.....
		Surrogate Judge	Judge Dean	209 50	.....
		Local Master	"	940 00	.....
		County Attorney.....	A. P. Devlin	181 55	.....
		Clerk of the Peace.....	"	748 38	.....
		Local Registrar	William Grace.....	100 50	675 0
		County Court Clerk.....	"	642 25	.....
		Surrogate Registrar	"	405 00	.....
Waterloo.....	Berlin.....	Sheriff.....	Moses Springer.....	2971 36	.....
		Surrogate Judge	Judge Miller	commuted at.	
		Local Master	Judge Lacourse.....	683 75	.....
		County Attorney.....	W. H. Bowlby.....	200 10	.....
		Clerk of the Peace	"	1132 17	.....
		Local Registrar.....	John McDougall.....	198 00	1075 0
		County Court Clerk.....	"	198 28	.....
		Surrogate Registrar	A. J. Peterson.....	442 17	.....
Welland	Welland	Sheriff.....	George J. Duncan	3526 33	.....
		Surrogate Judge	Judge Baxter.....	289 50	.....
		Local Master	"	318 84	.....
		County Attorney.....	L. D. Raymond	251 74	.....
		Clerk of the Peace.....	"	794 41	.....
		Local Registrar	I. P. Willson.....	252 80	1000 0
		County Court Clerk.....	"	310 05	.....
		Surrogate Registrar	D. D. Everardo.....	591 00	.....

SCHEDULE shewing Return of Fees and Emoluments of [illegible]

No.	County Town	Name	Office	Amount Earned	Salary paid by Province	Fees Paid to Crown	Fees paid to Treasurer	Net Amount	Amount retained by Officer	Fees Paid to Crown	Fees paid to Treasurer	Cost of Office	Net Amount	Amount paid to Treasurer on account of Salary	Remarks
				$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$	$ c.	$	$ c.	
[illegible]	[illegible]	Clerk of the Peace,	[illegible]	1405 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SCHEDULE showing Returns of Fees and Emoluments, etc.—*Continued.*

County or District	County Town	Office	Name	Amount of Salary	Amount of Allowance for Office Rent	Total Amount of Salary and Allowance	Total Amount of Fees and Emoluments received by the Officer	Amount of Fees and Emoluments retained by the Officer	Total Amount	Deduction on account of Superannuation	Amount paid to Treasurer	Net Amount	Net Amount of Fees and Emoluments paid to Treasurer	Remarks
Prince Edward County	East Adolphustown	Surrogate Judge	Isaac Hamilton											
		Local Master												
		County Attorney	A. R. Lowe											
		Registrar of Deeds		No Returns have been made to Hon. Minister of Justice.										
		Local Registrar	C. Kerr											
		Clerk of the Peace												
		Sheriff												
York	East York	Sheriff		1,000 00		1,000 00	540 70	1,540 70	734 40	806 30	98 50	707 80	1,572 30	1,600 00
		Surrogate Judge		500 00		500 00		500 00		500 00			500 00	
		Local Master		600 00	240 00	840 00		840 00		600 00	1 10	598 90	600 00	1,200 00
		County Attorney	A. McDonald	1,800 00		1,800 00		1,800 00		1,800 00			1,800 00	
		Crown Attorney		700 00		700 00	48 55	748 55		700 00	2 00	698 00	748 55	1,400 00
		Local Registrar		1,000 00	600 00	1,600 00		1,600 00		1,600 00		1,450 00	1,450 00	
		Deputy Registrar		1,000 00		1,000 00	4 00	1,004 00	4 00	1,000 00		1,000 00	1,000 00	
		Sheriff		1,000 00	400 00	1,400 00	351 70	1,751 70		1,400 00	70	1,330 00	1,400 00	1,751 70
Toronto	East	Sheriff		1,000 00	200 00	1,200 00	240 54	1,440 54	1,440 54				1,440 54	1,440 54
		Surrogate Judge		1,000 00	200 00	1,200 00	70 00	1,270 00		1,200 00	230 00	970 00	1,200 00	1,200 00
		Local Master		600 00	240 00	840 00	6 00	846 00		600 00	6 00	840 00	846 00	846 00
		County Attorney	H. [illegible]	200 10		200 10		200 10		200 10			200 10	
		Crown Attorney		1,000 00	400 00	1,400 00	11 17	1,411 17		1,411 17	1 00	1,410 17	1,411 17	1,411 17
		Local Registrar	[illegible]	198 00	1,000 00	1,198 00	127 00	1,325 00		1,325 00		1,325 00	1,325 00	
		County Crown Attorney		1,000 00	471 28	1,471 28	185 00	1,656 28		1,656 28	471 28	1,185 00	1,656 28	1,656 28
		Clerk of the Peace	[illegible]	1,000 00	143 17	1,143 17	114 17	1,257 34		1,257 34	114 17	1,143 17	1,257 34	1,257 34
Wellington	Wellington	Sheriff		1,000 00	400 00	1,400 00	268 00	1,668 00		1,668 00	268 00	1,400 00	1,668 00	1,668 00
		Surrogate Judge	[illegible]	1,000 00		1,000 00	280 00	1,280 00		1,280 00			1,280 00	
		Local Master		1,000 00	400 00	1,400 00	171 80	1,571 80	10 00	1,561 80	6 00	1,555 80	1,571 80	1,571 80
		County Attorney	[illegible]	1,000 00	400 00	1,400 00	200 74	1,600 74	1 00	1,599 74		1,600 00	1,600 74	
		County Crown Attorney		1,000 00	400 00	1,400 00	480 76	1,880 76	1 00	1,879 76	1,141 76	738 00	1,879 76	1,880 00
		Local Registrar	[illegible]	1,000 00	800 00	1,800 00	1,250 00	3,050 00		3,050 00		1,000 00	1,000 00	
		County Crown Attorney		1,000 00	1,000 00	2,000 00	310 05	2,310 05	1,062 85	1,247 20	289 00	1,400 00	2,311 05	2,310 05
		Sheriff of Provisional Judicial District	[illegible]	1,000 00	1,000 00	2,000 00		2,000 00		2,000 00		1,000 00	2,000 00	2,000 00

Fees and Emoluments, etc.—*Continued.*

Salary paid by the Government.	Total Earnings and Salary.	Total Earnings and Salary by officer in all his offices.	Amount received for present year.	Amount received for previous year.	Total receipts.	Total receipts by officer from all his offices.	Amount disbursed.	Net amount received.	Net amount due to or received by officer by virtue of all his offices.	Remarks.
$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	
.....										
.....										
.....										
.....;	appointed lately.									
.....										
675 00										
.....										
.....	2949 79	2949 79	2241 93	744 44	2986 37	2986 37	1709 11	1277 26	1240 68	
.....	209 50	.....	209 50	.....	209 50	.....	.....	209 50	.....	
.....	940 00	1149 50	940 00	.....	940 00	1149 50	40 00	900 00	1109 50	
.....	181 55	.....	181 55	.....	181 55	.....	.....	181 55	.....	
.....	748 38	929 93	748 38	.....	748 38	929 93	.....	748 38	929 93	
.....)	775 50	.....	775 50	.....	775 50	.....	1 50	774 00	.....	
.....	642 25	.....	484 95	125 00	609 95	.....	45 00	564 95	.....	
450 00	405 00	1822 75	405 00	.....	405 00	1790 45	35 00	370 00	1741 25	
.....	2971 36	2971 36	2621 31	136 39	2757 70	2757 70	1430 38	1327 32	1540 98	
.....	704 00	704 00	704 00	.....	704 00	704 00	.....	704 00	704 00	
.....	683 75	683 75	683 75	.....	683 75	683 75	.....	683 75	683 75	
d at.	200 10	.....	200 10	.....	200 10	.....	.....	200 10	.....	
.....	1132 17	1332 27	1132 17	.....	1132 17	1332 27	400 00	732 27	932 27	
.....)	1273 00	.....	1273 00	.....	1273 00	.....	10 00	1263 00	.....	
.....	198 28	1471 28	198 28	.....	198 28	1471 28	10 00	188 28	1451 28	
675 00	442 17	442 17	442 17	.....	442 17	442 17	54 83	387 34	387 34	
.....	3526 33	3526 33	2689 45	.....	2689 45	2689 45	1271 39	1418 06	2254 94	
.....	289 50	.....	289 50	.....	289 50	.....	.....	289 50	.....	
3	318 84	608 35	174 89	10 60	185 49	474 99	30 62	174 37	577 73	
)	251 74	.....	200 74	45 00	245 74	.....	21 00	224 74	.....	
*	794 41	1046 15	480 76	338 21	818 97	1064 71	22 25	796 72	1002 90	
) .....)	1252 80	.....	1251 65	.....	1251 65	.....	30 69	1220 96	.....	
5	310 05	1562 85	289 25	.....	289 25	1540 90	8 13	281 12	1524 03	
2	591 00	591 00	522 60	63 95	586 55	586 55	234 20	352 35	356 80	

FIFTEENTH ANNUAL REPORT

OF THE

ENTOMOLOGICAL SOCIETY

OF

ONTARIO.

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FIFTEENTH ANNUAL REPORT

OF THE

ENTOMOLOGICAL SOCIETY

OF

ONTARIO.

To the Honourable the Commissioner of Agriculture:

SIR,—I have the honour to submit for your consideration the Fifteenth Annual Report of the Entomological Society of Ontario in accordance with the provisions of our Act of Incorporation.

The annual meeting of the Society was held in the city of London on October 15th, 1884, when the officers for the ensuing year were elected, and the necessary business of the Society transacted.

I also submit herewith our audited financial statement and the minutes of the annual meeting.

The publication of the *Canadian Entomologist*, the organ of the Entomological Society, is still well maintained.

I have the honour, sir, to remain,

Your obedient servant,

EDMUND BAYNES REED,
Secretary-Treasurer.

ANNUAL MEETING OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO.

The annual meeting of the Society was held in London, at the Society's Rooms, Victoria Hall, on Wednesday, October 15, 1884, at 7.30 o'clock p.m. The President, Mr. William Saunders, of London, in the chair.

Present: Mr. James Fletcher, Ottawa; Rev. Thos. W. Fyles, Quebec; Mr. J. Alston Moffatt, Hamilton; Mr. John W. Denton, London; Mr. Wm. H. Harrington,

Ottawa; Dr. Burgess, Mr. A. Puddicombe, Mr. H. B. Bock, Dr. Woolverton, Mr. L. B. Reed, and Mr. Chas. Chapman, of London; Mr. Macdonald, of the *Farmers' Advocate*, London, and the Sec.-Treas. Mr. E. Baynes Reed.

The President welcomed the members present, and expressed the regret they felt at the absence of some of those who in past years had attended the meetings, but were this year unavoidably absent, referring especially to Rev. C. J. S. Bethune, of Port Hope, and Mr. G. J. Bowles, of Montreal.

The report of the Council, the audited financial statement of the Secretary-Treasurer, and the report of the Librarian for the past year, were then submitted to the meeting, and on motion, duly received, discussed and adopted.

REPORT OF COUNCIL FOR 1884.

At the close of another year it becomes again the duty of the Council to present their Annual Report on the state and condition of the Society and the work it has been able to accomplish during the past year.

The report from the Montreal Branch, which will be laid before the meeting, testifies afresh to the zeal and energy which are displayed in furthering the objects and designs of the Society.

The Sixteenth Annual Volume of the *Canadian Entomologist*, the organ of the Entomological Society of Ontario, is now in course of publication, and as a record of original observation, maintains the standard of scientific interest and researches which for so many years has earned the favourable opinion of Entomologists in various parts of the world. The thanks of the Society are due to those gentlemen who contribute, for our information, the result of their investigations. The Council most cordially invite all the members of the Society to use the pages of the *Entomologist* as a medium of communication of any Entomological matter of interest that may come under their observation. The Council also desire to place on record their hearty appreciation of the services of the Editor, Mr. Wm. Saunders, under whose judicious management the publication of the *Canadian Entomologist* is so well sustained.

During the past year the Society has published, in pamphlet form, the very excellent description, by Kirby, of the insects of the northern parts of British America, contained in the fourth volume of Richardson's *Fauna Boreali-Americana*, published at Norwich in 1837. These descriptions were compiled, with much care and labour, by the Rev. C. J. S. Bethune, M.A., the first editor of the *Entomologist*, in whose pages they appeared from time to time.

By the kindness of Dr. G. H. Horn, of Philadelphia, the well-known Entomologist, the Synonymy of the Coleoptera, has been corrected and brought in accordance with the investigations of competent authority. The publication forms a convenient little volume and cannot fail to be useful to those interested. It is furnished to members at the price of publication.

The Council are gratified to be able to report that a very handsome silver medal has been awarded to the Society for the valuable collection of insects exhibited by them at the Fisheries Exhibition. The collection has been returned to the Society's rooms in perfect safety.

Mr. James Fletcher, the duly appointed delegate of the Entomological Society, attended the session of the Royal Society which was held at Ottawa in May last, and will present his report to the Society.

The President, Mr. Wm. Saunders, and Mr. G. J. Bowles, the President of the Montreal Branch, were present at the session of the American Association for the Advancement of Science, at Philadelphia, in the month of September, and attended the session of the Entomological Club. Mr. Saunders' report of their proceedings will be laid before the annual meeting and published in the Annual Report.

From press of work the Secretary-Treasurer, Mr. E. Baynes Reed, has been unable to complete the Index to the published volumes of the *Entomologist* which he had been

requested to prepare ; but the Council trust that the work will be ready for publication at no distant date.

The Council have carried out the wishes of the Society, as expressed at the last annual meeting, and through the assistance of the special committee that was then appointed, have prepared for distribution to members, blank forms for description of larvæ—a form of which is appended to this report.

During the year many interesting specimens have been added to the cabinet, including a collection of *Lepidoptera* from the North-West and British Columbia.

The Librarian, Mr. E. B. Reed, has prepared a report on the state and condition of the Library, which will be laid before the Society.

The audited annual financial statement, shewing a balance on hand of $99.36, will be submitted to you as usual.

Presented on behalf of the Council,

E. Baynes Reed,
Secretary-Treasurer.

London, Ont.,
October 15th, 1884.

ENTOMOLOGICAL SOCIETY OF ONTARIO.

Form for the Descriptions of Preparatory Stages of Insects.

Name of Species (if determined).....

Egg.

Size..... Form..... Colour..... Markings.....
Arrangement..... Duration.....Where laid..... Date.....
Mode of exit of larva.....Drawing of larva.....

Larva.

(Description taken on.....188.., after.....moult.)

Length—when at rest..... When in motion.....
Attitude—when at rest....When disturbed.... Form .....Head—(Segment No. 1.)—
Size and form..... Colour and markings..... Appendages.....
Body—(Segments No. 2—13).—*Upper surface*—General colour and texture of skin.....
Markings.....Appendages.....Spiracles—shape and colour.....
Under surface—General colour..... Markings..... Appendages .....
Thoracic feet..... Prolegs..... Food plant.....Habitat (or
(mode of concealment).....Duration of each moult and succeeding changes.....

Pupa.

Shape..... Dimensions.....Colour and markings.....
Mode of pupation.....Duration.....Cocoon (if any).....
Mode of attachment.....Locality.....

Remarks.

.....
.....Observer.
Date .....

Instructions.—In describing Larvæ, the description should begin with the head, which is the first segment (making the total number 13). Note first its size, whether large, medium, or small ; next its form, whether flattened, rounded, or pointed, etc. ; then the colour, markings, appendages, etc. Beginning the description of the body with the upper surface, give first its general colour, then the longitudinal lines, beginning with the dorsal. Where other markings occur, begin with the anterior and finish with the posterior segments, following the same order with appendages, such as hairs, spines, horns, tubercles, protuberances, granulations, etc., giving their size, form and colour. In describing the under surface, note first the general colour, then markings and appendages in the same order as above, finishing with the colour and number of thoracic feet and prolegs, giving their characteristics and markings.

In speaking of the marking of larvæ, a *line* is so called when thin ; if thick, it is termed a *stripe ;* if extra broad, it is called a *band.* The mark down the middle of the back is known as the *dorsal line :* this is sometimes merely a pulsating vessel seen through the skin. The stripe along the side, at the bottom of which the spiracles are usually situated, is called the *stigmatal line.* When there is an intervening line between the two lines mentioned, it is called the *sub-dorsal line.* The space between the dorsal and sub-dorsal lines is called the sub-dorsal space, and between the sub-dorsal and stigmatal lines the stigmatal space.

ANNUAL STATEMENT OF THE SECRETARY-TREASURER OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO, FOR THE YEAR ENDING OCTOBER 15TH, 1884.

Receipts.

Balance from previous year, 1883	$ 8 47
Members' fees, sale of *Entomologist*, etc	174 94
Provincial grant, 1884	1000 00
Collectors' material—pins, cork, etc	14 80
Interest on Savings' Bank account	6 99
	$1205 20

Disbursements.

Canadian Entomologist, printing, paper, stationery, etc	$446 83
Library account	103 58
Expenses of report for 1883, including engraving, electrotypes and woodcuts	134 75
Annual vote to Editor and Secretary	175 00
Rent	80 00
Caretaker	5 00
Insurance—2 years to Sept. 30th, 1885	32 00
Collectors' material—cork, etc	51 92
Expense of deputation to A. A. A. S., Philadelphia	37 00
Sundries—postage, etc	39 76
Balance	99 36
	$1205 20

We certify that we have examined the above account with books and vouchers and found the same to be correct. Balance in hand and in Bank, ninety-nine dollars and thirty-six cents.

H. P. BOCK,
W. E. SAUNDERS, } *Auditors.*

London, Ont., Oct. 15, 1884.

The Report of the Librarian and the Report of the Montreal Branch of the Society were read.

The delegate to the Royal Society of Canada next submitted the report which he had presented to that honourable body.

Report of the delegate of the Entomological Society of Ontario to the Royal Society of Canada:

It affords me much pleasure, as delegate from one of the Societies honoured with an invitation to send a representative to the meetings of the Royal Society of Canada, to report that,—

During the past year the work of the Entomological Society of Ontario has been vigorously prosecuted on the same plan as that heretofore followed with satisfactory and evident results.

The monthly organ of the Society, the *Canadian Entomologist*, has been regularly issued, its pages having been entirely filled with original contributions from members of the Society on scientific and practical entomology. The volume which closed with the year 1883, No. XV., consisted of 246 pages and contained a number of papers on descriptive entomology, embracing descriptions of no less than four new *genera* and sixty-seven species of insects new to science: also papers on practical entomology, including life-

histories of species, some of which have been minutely described in all their stages, and among them many injurious to agriculture.

With a view to popularize the Science of Entomology and to encourage beginners in the study, a special series of illustrated articles has been published which we hope will have the effect of increasing the numbers of observers in this important branch of biology. To further this end and to systematize the descriptive work being done in such a manner as to secure uniformity in this department of research, the Council have prepared forms containing instructions for describing insects in their different stages.

There has also appeared during the year in the *Canadian Entomologist* much valuable information in reference to the geographical distribution of North American insects.

For the benefit of those interested in agriculture and horticulture, the Annual Report, which is always devoted to this practical aspect of the study, has recently been published covering 83 pages and embracing the report of the Council, the treasurer's statement, the president's inaugural address, in which a review is given not only of the work of the Society during the year, but also of most of the important events of interest to entomologists in North America, as well as popular articles giving descriptions of, and remedies for, such insect foes as may have been found particularly injurious to our forest trees and field crops.

In addition to this a circular is being now prepared for circulation among the farmers and agriculturists of the province, requesting them to report as promptly as possible on any insects which they may find injuring their crops, with a view to the suggestion of appropriate remedies.

The membership of the Society still increases and now stands at about 400, and we have on our roll members who are working for us in every province in the Dominion, as well as many of the leading entomologists in the United States. We have, however, to deplore with the whole scientific world, the loss by death during the past year of some of our most active members. Of these special mention may be made of Prof. Croft, the founder of our Society, and Dr. J. L. LeConte, the celebrated coleopterist.

The large collections of the Society have been further added to and the library considerably augmented, their usefulness for purposes of reference and study thus being much increased.

At the request of the Dominion Government, the Society undertook the preparation of a collection of specimens designed to illustrate insects injurious and beneficial to fish, to be exhibited in the International Fisheries Exhibition held last year in England. This collection consisting of forty cases was prepared and sent forward to London, where it formed a most useful and attractive feature of the Canadian exhibit, and its merits were recognized by the award of a silver medal.

The Council of the Entomological Society of Ontario are glad to learn that the suggestions contained in their Report to your Honourable Society last year, with regard to increased facilities for the transmission of Natural History specimens by mail, are, in response to a petition from the Naturalists and students of Science in Canada, receiving favourable consideration from the Hon. the Postmaster General, and they trust that the Royal Society of Canada will continue to use its influence in this direction on behalf of the students of Natural History.

JAMES FLETCHER,
Delegate.

Mr. Saunders then presented the following exceedingly interesting report of the meetings of the Entomological Club of the American Association for the Advancement of Science recently held in Philadelphia, which he had attended as a delegate from the Entomological Society of Ontario. In submitting it he stated that this was one of the fullest reports which had ever been prepared of the discussions of that important body—a result arising from the fact that it embodied a large proportion of the minutes taken by the excellent secretary of the club, Mr. John B. Smith, of Brooklyn, N.Y., who had taken down the remarks of the members in shorthand and afterwards written them out in full. Through the kindness of Mr. Smith a copy of these minutes had been placed at his disposal.

MEETING OF THE ENTOMOLOGICAL CLUB OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

Pursuant to notice, the members of the Entomological Club of the A. A. A. S. met at 2.30 p.m., September 3, 1884, at the Hotel Lafayette, in Philadelphia. Present: Herbert Osborn, Ames, Iowa; Dr. John G. Morris, Baltimore: Dr. G. H. Horn, Dr. Henry McCook, Eugene M. Aaron, E. T. Cresson, Philadelphia, Pa.: C. H. Fernald, Orono, Maine; Rev. G. D. Hulst, John B. Smith, E. L. Graef, Brooklyn, N. Y.; C. V. Riley, B. P. Mann, Washington: J. H. Emerton, G. Dimmock, Cambridge, Mass.: L. M. Underwood, Mr. Larkin, Syracuse, N. Y.: Dr. P. R. Hoy, Racine, Wis.: Wm. Saunders, London, Ontario: J. A. Lintner, Albany, N. Y.: Dr. Maclosky, Princeton; Dr. Hart Merriam, Locust Grove, N. Y.: H. H. Lyman, G. J. Bowles, Montreal; Prof. Martin. Messrs. Moore, Hunt, Casey, Wenzell, and others.

In the absence of the President, D. S. Kellicott, of Buffalo, N. Y., the Vice-President, Herbert Osborn, was called to the chair. A letter was read from Mr. Kellicott, regretting his inability to attend.

The election of officers was then proceeded with, and resulted as follows: —

President	Dr. John G. Morris.
Vice-President	Herbert Osborn.
Secretary	John B. Smith.

Dr. G. H. Horn made some remarks on the historic associations connected with the spot where the present meeting was held. Many years ago when this site was far out of the City of Philadelphia, the Museum of Natural History was there erected, and in the corner occupied by Parlor C of the hotel, stood the skeletons of a horse, ox or other large mammal. Here Thomas Say, poor in pocket, though rich in brain, having no other place to go, put up his bed under these skeletons, and that for many months was his only home there also he contracted the illness which eventually caused his death.

The Secretary then read a short paper by D. S. Kellicott, as follows:

A NOTE: OVIPOSITING APPARATUS OF NONAGRIA SUBCARNEA.

At the Minneapolis meeting of this Club, I read a note on the life history of this species, the substance of which, together with a brief description of the moth, has since appeared in the *American Naturalist*. Since then I have ascertained how the eggs are placed and protected through the winter, and have examined somewhat the structure of the egg-placing apparatus. I have submitted an account of this moth to the Publication Committee of the Buffalo Society of Natural Sciences, from which I am permitted to extract the following remarks. I enclose also a tin-type of the drawings accompanying the paper mentioned, together with a fragment of a *Typha* leaf with the edges rolled over rows of eggs.

Figure 2 represents the ovipositing apparatus as seen from one side and below. Explanation is scarcely necessary. The last two abdominal joints are strangely modified, constituting a complex apparatus. The last joint is laterally broad, chitinous, except at base, terminating in two finger-like processes (*c*); these are rounded at the apices and curved downwards as represented in the drawing; at *b* are two concave discs with a deep groove (*g*) leading up to the anal orifice; it is evidently along this channel that the eggs are passed by the ovipositor; on either side and below the groove there is a strong chitinous ridge with saw-like teeth pointed backward (*e*). The other modified ring consists of a heavy hard band (*a*) with stout posterior processes for muscular attachment; below are two stout chisels (*d*) pointing backward and overlapping the first basal teeth of the "saws" of the last ring.

I have not succeeded in witnessing the act of oviposition. Numerous females were kept in an abandoned aquarium with *Typha* leaves, and the same watched faithfully; it was approached by day and by night, but all were concealed and quiet whenever observed. Day by day I could find additions to the stock of eggs, but the manner of performing the

delicate operation of folding over and cementing down the leaf edge, forming a secure tube for the eggs, I was not permitted to see. The eggs laid in September remained unhatched in the tubes until spring.

Fig. 3 of the tin-type represents the remarkable frontal "spine" of the moth, by means of which it rips open the pupa cell in the stem of the *Typha* and escapes. Fig. 4 represents the same of *N. typhæ*, and fig. 5 that of *N. subflava*. That of the last is hardly bilobed; under an inch objective, however, the apical notch appears. Only one examined.

The tin-type showing the structural details was examined by the members.

Mr. J. B. Smith said that the clypeal modification referred to was not peculiar to this species, but was shared by all others of the same genus. Clypeal modifications were very common throughout the Noctuidæ; indeed almost universal in species living in the stems of plants where the insect had obstructions to overcome in emerging from the pupa.

Mr. Smith exhibited six large photographic plates of *Agrotis*, illustrating a large number of species, and made some remarks on the great structural variability of the group *Agrotis*. Fully 26 groups, based mostly on structural characters, were indicated. Spinulation of tibiæ, structure of front, vestiture, form of wings, antennal structure and general habitus, all are variable, and so gradual are the gradations that generic types can not be well founded on them. The plates were examined by the members, and it was agreed that they were fine specimens of the photographer's art as applied to this branch.

Dr. Morris asked whether the tendency had not been of late to an unnecessary increase of genera in all orders.

Mr. Smith said that as to the Noctuidæ undoubtedly genera were based upon apparently insufficient characters, but less so than in Coleoptera.

Dr. Horn said it was a principle long since laid down by Lacordaire that characters scarcely of specific value in one group formed excellent bases of even higher divisions in others; in his view genera are established for convenience merely and have no existence in nature. Nature has only species, and genera were simply useful in dividing the mass of species to facilitate recognition. However, of late, as new material was becoming more scarce, persons seized with the *mihi* itch were taking to describing genera; for some 12,000 species of N. A. Coleoptera, fully 2,000 genera were described.

Dr. McCook said that in ants and spiders there is plenty of opportunity for persons afflicted with that itch, as there was a very large unworked field there, and plenty of new forms. About 200 species (American) are thus far described. Of spiders a somewhat larger number.

Mr. Emerton said there were some 400 described species, and that naturalists generally had no idea what a very great variety of spiders really existed.

Mr. Mann read a letter from O. S. Westcott, of Maywood, Ill., suggesting the formation of a stock company for the purpose of publishing an American entomological journal, and after a lengthy discussion the question was referred to a special committee consisting of Messrs. Mann, Osborn, Horn, Aaron, and Smith.

Prof. Fernald presented an invitation from the Agassiz Association, received by him, inviting the members to be present at a lecture by Dr. McCook, in Franklin Institute this evening. This invitation was accepted by the Club.

Prof. Fernald then asked for the opinions of the members on the following points:—

1. Where a name has once been published by an author, shall we change the mode of spelling to one more consistent with the derivation? e. g., Treitschke, Schmet. viii., established the genus *Cochylis*. Shall we adopt his spelling, or the more correct *Conchylis*?

Dr. Horn said he would not change it; that generic names are mere aggregations of letters representing a living thing, and that at least one well known entomologist habitually formed generic names by coining words without any meaning whatever, merely with a Grecian sound, and generally euphonious. If such names were accepted, so should misspelled names be. Some purists would make every name correspond with its origin, and it had been proposed to change the well-known and universally accepted term, *Bembidium*, into *Bembicidium*; this was displaying learning without adding to knowledge.

Mr. Mann agreed with Dr. Horn. Dr. McCook thought a manifest error might be corrected, but would not make the correction if thereby an author's right of priority were

destroyed, i. e., if the name thus changed were pre-occupied at the time it was originally proposed.

2. When an author once publishes a name which is manifestly incorrect in orthography, and in a later work corrects his own error, shall we adopt his correction? e. g., Treitschke published the genus *Pendina*, but later corrects it to *Penthina*.

Dr. Horn thought that where the derivation of a name was stated, a manifest error might be corrected by the author, but it would depend somewhat upon how general the use of the name had become; he was inclined to adhere to the name as originally written.

Mr. Mann also thought it would depend upon how much the name had entered into use. If it had not become known or used as erroneously written, and the author's correction was made in a reasonable time, it should be adopted.

3. Should the termination of the specific name be made to agree with the generic in gender? *e. g.*, Zeller and some others write *Tortrix viridana*, *Exartema permundanum*, and *Lophoderus ministrauus*. Shall this rule be adopted, or shall we adopt the ending *ana* irrespective of the gender of the genus?

Dr. Horn said that in Coleoptera the rule was that specific and generic names should agree in gender, and he thought the rule should be universal. Where, however, a termination had some special signification, where it indicated the group to which the species belonged, there, if it had come into general usage, he would favour uniform terminations.

Mr. Mann did not believe in uniform terminations.

4. When a Tortricid species is described with a name not ending in *ana*, should this be changed to *ana*? *e. g.*, *Carpocapsa pomonella* Linn. Prof. Fernald himself was opposed to such a change. Dr. Morris suggested that Linne's names be left as he made them.

5. To what extent should the law of priority be made use of? Shall we make use of the oldest name, even if the species has been known under another for a long time? If not, for how long a time must a name universally or generally be in use to take precedence over an older name?

The sentiment of the meeting was strongly expressed that so much discussion without agreement had been hitherto had on that question, that no universally accepted conclusion could be reached.

6. What should be taken as the starting point in nomenclature? Some have taken the 12th Ed. of Linne's Syst. Nat., while others have taken the 10th Edition.

Dr. McCook thought the rules heretofore adopted by the British Association covered that point in favour of the 12th Edition.

Prof. Fernald replied that many of the subscribers to that rule had now changed their opinions on that point, and had taken the 10th Edition as a starting point.

Mr. Smith said, the Noctuidæ alone considered, it made no practical difference which edition was used, and so far as Tortricidæ were concerned, he did not think that any practical difficulty would arise, whichever edition was used.

Prof. Fernald expressed surprise that so much discussion should have arisen over Hübner's works, and that his names should have been so universally rejected, while Guenée's names in the *Index methodicus*, unaccompanied by a word of description, were recognised and used without question. Hübner at least gave some sort of definition to his divisions, genera or *coiti*, so called.

Dr. Horn suggested that there might be some analogy to the cases of Erichson and Motschulsky; both of these had created some genera, not, or incompletely described, but while Erichson's genera had been universally adopted, those of Motschulsky had been as universally discarded. The reason was, Erichson's genera usually meant something and had some solid foundation, and he himself had credited to Erichson some genera first described by him (Dr. Horn) under the names proposed by Erichson. Motschulsky's genera, on the contrary, were based upon the flimsiest characters as a rule, and had no value whatever.

Mr. Smith said that as to the Noctuidæ at least, the parallel would hold. Hübner's genera were very largely devoid of all foundation, while Guenée, as a rule, made pretty good genera and mostly described them.

Prof. Fernald thought this not true of the Tortricidæ; that quite as many names of Guenée were baseless as of those proposed by Hubner.

Mr. J. H. Emerton announced that the types of a large number of the species described by him in his work on the "New England Spiders of the Family Theridiidæ," and all the types of a paper now in press, were at the Academy of Natural Sciences, and he would be happy to exhibit them to any who would make an appointment with him for that purpose.

On motion, the meeting was adjourned until 2.30 p.m., Sept 4th, to meet then at the Entomological Rooms in the Academy of Natural Sciences, the use of this room having been offered by Messrs. Horn and Aaron on behalf of the A. E. S.

Pursuant to adjournment, the Club met at the rooms of the Am. Ent. Soc. at 2.30 p. m., Sept. 4th, Dr. Morris in the chair. The minutes of the previous meeting were read and adopted.

The committee appointed at the last meeting reported that they did not consider that the scheme proposed by Mr. Westcott for the publication of an entomological periodical, a practicable one for the Club to undertake.

Mr. Smith gave an account of the secondary sexual characters of the Noctuidæ, illustrated by blackboard sketches, showing peculiarities of leg structure in the male butterflies and some analogous variations in the Deltoids, in which latter group the tibiæ often become aborted, while the first tarsal joint is often so abnormally developed that it is usually mistaken for the tibia. The peculiar brushes of the fore legs were noticed and some modifications commented on. The abnormal development of the last tarsal joint of *Palthis* was illustrated, as was also the peculiar palpal structure of the ♂ of that genus; so of antennæ, the peculiar bends and tuftings of the ♂, especially of the group *Herminiinæ*, were noted, as were the more usual pectinations. In conclusion, Mr. Smith mentioned the varying practice of systematists as to what generic value these characters should have. In some instances these male characters were wanting, while in all other respects the species agreed with others in which all these peculiar structures were well developed; on the contrary, occasionally a species would be found which offered some peculiar character in the ♂ not usually found in its near allies, instancing *H. paradoxus*, in which the ♂ has a pellucid impression in the fore wing, around which the venation is somewhat modified. What shall we do with such a species? The ♀ well fits into *Heliothis*. Shall the ♂ then authorize a genus where the ♀ offers no basis for it? Students of other groups should give their experiences.

Prof. Fernald said that in the Tortricids, generic, and even higher value, had been given to these characters. The costal fold was a prominent ♂ character, abnormally developed in many exotic forms. In a South India form it extends full two-thirds across the wings, while in other Indian and Japanese species it is very wide, but not so abnormally developed. Families have been based upon these characters, and one genus has been based upon a character peculiar to the ♀ only. This genus he thought would have to be abandoned.

Dr. Horn said that in systematic work and in characterizing a species both sexes should be considered. It requires two individuals, a ♂ and a ♀, to make a single complete example of a species, and classification should consider these individuals together in assigning positions to them. Synoptic work has a higher purpose than a mere aid to a recognition of species.

Prof. Fernald was interested in Dr. Horn's view of the case: he had been interested in the view that nature had no genera, but species only. For his part he thought he would be satisfied if he had a good definition of a species.

Dr. Maclosky said that birds sometimes offer remarkable differences in sex, and species can be distinguished only by a reference to both. The flickers, for instance, of the two sides of the continent were very distinct, but in some intermediate localities the species approached so closely that it was difficult, if not impossible, to distinguish the females, while the males were separable. There was no anatomical difference between the species, but he thought there must be physiological characters not yet discovered which separated them.

Dr. Morris thought it a curious classification that would place male and female in different genera if separately considered.

Mr. Osborn read a paper on *Mallophaga* and *Pediculidæ* of N. A., illustrated by

drawings of specimens and slides containing specimens mounted for microscopic examination. (This paper will appear separately in the C. E.)

Miss Cora H. Clarke exhibited a specimen of the work of some Caddis Fly larvæ *(Hydropsyche)*, consisting of an aggregation of mud cells on a small stone, beyond which were the nets spread by the larvæ. They were always found in running water, and always had an opening toward the current, probably to enable the larva to catch the food coming down the current. In reply to a question from Dr. Morris, Miss Clarke said the nets were often solitary, but not unfrequently aggregations were found. Another species, of *Plectrocnemia*, builds a vertical tube of mud, sometimes with a number of branches: a specimen was exhibited. Dr. Hagen thinks it an undescribed form. Reference was made to figures in a paper entitled "Description of two interesting houses made by Caddis Fly Larvæ, by Cora H. Clarke." The larvæ living in running water were difficult to raise.

Mr. Mann remarked that *apropos* of raising larvæ living in running water, Prof. Barnard, of the Dept. of Agriculture, had contrived an arrangement with which he had great success with larvæ of that kind. It consists of a glass tube, the bottom closed by a porous cloth, the other end fastened to a faucet; the water could be thus kept steadily flowing with any desired rapidity.

Dr. Morris exhibited a gall recently collected, the inclosed larva not bred, and asked for information as to the probable producer.

Mr. Mann said the subject of galls had puzzled him in his bibliographical work, especially as to the proper method of indexing them. He had referred to them under the head of systematic botany, but doubted his correctness.

Dr. Morris asked what orders of insects contained gall producers. Mr. Osborn thought about all orders except Neuroptera and Orthoptera. Mr. Smith said that at least one American species of *Apion* is known as a true gall producer, and in Europe several species are known to produce root galls. Mr. Osborn said that many plants, especially the *Rosacea*, were much subject to galls, while others were rarely if ever so infested. He thought them abnormal products so far as plants are concerned, and as rather belonging to insect economy since they are caused by insects; not only that, but insects were often most readily distinguished by the form of the galls, and in the case of mites those of the maple and ash were much alike, but produced very easily distinguishable galls.

Dr. Hoy thought the galls were pathological appearances, and were rather diseases of plants and should be classed as such. In descriptive botany they had no place, any more than in a description of the lips cancer should be treated of.

Mr. Mann stated he had also indexed them under pathological botany and under insects, but the chief difficulty had arisen through a descriptive paper treating galls from a botanical standpoint.

Dr. Morris said that he had seldom seen such a dearth of larvæ of all kinds, and butterflies were exceedingly scarce.

Mr. Saunders thought there had been no unusual want of insects in Canada. *Turnus* has been common, and so was *cardui*; the latter, indeed, had been extremely abundant in Manitoba, where it had destroyed large quantities of thistles, and caused great alarm on the part of farmers, who thought it would also attack their crops. *Thecla niphon*, usually rather a rare form, was found in some abundance this season, and in the early part of May quite a number of specimens were captured.

Dr. Hoy said that as compared with previous seasons, *cardui* has appeared in immense numbers, fifty for one. It had never previously to his knowledge attacked the hollyhock or sunflower. This season it has literally stripped the leaves from these plants, preferring them apparently to thistles. Other butterflies had been scarce.

Prof. Osborn said in Iowa butterflies had been unusually common.

Mr. Underwood said he had found butterflies unusually common in Central N. Y., *turnus* especially, but for five weeks spent in Connecticut everything was scarce excepting *cardui*.

Prof. Fernald said in the first part of the season insects were very rare. Butterflies alone appeared about as common as usual, *turnus* unusually common; *cardui* had been rare until this summer, when it was common. Last season Mrs. Fernald had collected

both at sugar and at flowers cultivated because of their attraction to insects, and flowers had proved most productive; this season the reverse has been the case.

Mr. Mann, referring to a remark made that cold winters were favorable to insect life, said that seemed to be the generally accepted theory now, and appeared borne out by facts.

Mr. Aaron said that everywhere insects are reported as exceedingly scarce. His brother from Texas so writes; from Florida, Arizona and California come the same complaints. The remarks on the abundance of *cardui* reminded him of a saying of Mr. Ridings that he was always afraid of a season in which *cardui* was common, for then nothing else would be found.

Mr. Smith said he believed cold winters favorable to insect life, but this year there was not only a cold winter, but there were several very severe frosts late in spring, one as late as June 14th-15th; it was rather these late frosts that were to be blamed for the dearth of insect life. On Cape Cod insects were unusually rare; in Vermont, where hundreds of good insects were last year taken at sugar, scarcely one-fourth the number of common forms were this year found.

Dr. Hoy said that in his vicinity, far north as it is, he has taken many insects usually considered southern—more than were taken on the east of the lake. There seems to be a northern extension of the thermal line on the west of the lakes. Last season he found four specimens of the black variety of *turnus*; before only a single specimen had been found.

Mr. Saunders had never known this black variety to occur in Canada.

Dr. Merriam had found *turnus* in the central Adirondack region nearly as far north as Racine, three to four thousand feet above the sea. There were often hundreds at puddles, and among them many of this black variety.

Prof. Fernald reported the capture in Maine of a suffused form, partially yellow and part black.

Dr. Hoy asked whether all the food plants of *P. ajax* were known. He has found perfectly fresh specimens, and no pawpaw within 200 miles of the place. The butterfly is often common, but he has never found the food plant of the larva.

Mr. Larkin had noticed at his station, south of Syracuse, that insects were unusually scarce. The potato beetle even was very rare—not found at all in some fields. He had noticed that when they have winters that kill wheat, then usually the apple crop is good and there are few insects.

Mr. Aaron said, in reply to Dr. Hoy's query, that *ajax* would feed on either spice-wood or upland huckleberry, as well as pawpaw.

Dr. Hoy said they had the huckleberry, not the spice-wood.

Mr. Osborn said he had seen *ajax* in Iowa where they had neither pawpaw nor the huckleberry, and he thought no spice-wood. He also reported a statement from Sioux City that there, *Chrysochus auratus* was so common that they were crushed under foot on the streets. Was not this unusual?

Mr. Mann said in the woods he had seen them piled in great heaps upon the stones.

Mr. Saunders said *Hyphantria textor* had this season been found in great abundance on all kind of trees. *Var. progne* had been sent from one locality in West Ontario, where it was so common on currants that fears had been entertained for the crop. No great damage had been done, however.

Mr. Graef exhibited some species of Lepidoptera, rare, or typical of recently described forms.

On motion, the meeting adjourned to Monday, Sept. 8, at 2.30 p.m., same place.

Sept. 8th, 1884. Pursuant to adjournment, the Club met at 2.30 p.m., President Morris in the chair. The minutes of the previous meeting were read, corrected and adopted.

Prof. Martin exhibited some insects imbedded in copal, all representing types of post-tertiary forms, mostly small Hymenoptera and Diptera, but some Coleoptera, Lepidoptera and Hemiptera. The specimens were obtained by seekers of the resin of which copal varnish is made, not far from the sea coast, a little north and south of the equator. The same sort of gum is now found on growing trees, but soft, and not good for varnish, used

only for the purposes of adulteration. The true gum in which these insects were found was obtained in districts where the trees had long been extinct, and was found only by digging. All the species were post-tertiary forms, and he had especially noted types of *Cleri*.

The specimens, which were very clear, were handed to the members for examination.

Dr. Horn said that the Coleoptera all represented existing generic types: 1. Carabid, allied to *Callida*; 2. Chrysomelids, 2. Clerids, *Clerus ocymatodera*: 2. Longicorns, allied to *Clytus* and *Leptura*, and an Elaterid much like one of our species of *Cardiophorus*.

Mr. Smith said the Lepidoptera were all of very recent types; one specimen was almost surely a *Mamestra*. The Hemiptera were also very like species known to him, and at least one Dipteron represented a very common Muscid type.

Prof. Lintner gave some notes of observations made during the past year.

Orgyia leucostigma, else very common and destructive at Albany, was this season very rare, and did no damage. Usually they defoliated the elms and horse chestnuts, and sometimes when a heavy storm came on so many were destroyed that they became offensive. This rarity is explained by a severe frost which occurred in spring just as the larvæ were hatching.

An interesting note came from Prof. Cook, of Michigan, where thousands of a Noctuid larva created fears for crops. The larva was bred, and proved to be *Agrotis fennica*, usually considered rather a rare insect. So common were they that they were called the black army worm.

From Jamestown, N. Y., an Hemipterous insect, *Podisus cynica*, has been received, and it was there observed destroying the currant worm in numbers. Its variety, *P. bracteata* Fitch., was associated with it.

From the vicinity of Rochester *Lygus lineolaris* has been recorded as injurious to young peas, piercing and blotching them, a fact not previously noted.

At Geneva, N. Y., *Poecilocapsus lineatus* has seriously injured gooseberry plants, stinging the branches at tip so that they died off two or three inches downward.

In Coleoptera, the Clover-leaf Beetle has spread westward, and has nearly reached the western limits of the State. Some three years since it was recorded from Yates and adjoining counties, and since has spread rapidly; moreover, a new habit has been acquired, *i.e.*, it now has attacked beans. The insect is *Phytonomus punctatus*, an imported species.

The Asparagus Beetle, *Crioceris asparagi*, has made its appearance at Geneva, N. Y. Heretofore it has been confined pretty closely to the sea shore, and though known for many years on Long Island, it has never before manifested any tendency to spread.

From Sycamore, Oswego Co., an interesting attack of *Otiorhynchus ligneus* was reported; there a house which for four years had been closed, was opened and found swarming with these beetles; they were everywhere, and in many rooms nearly a quart was swept up. What did they feed on? There was nothing eatable in the house; they had been recorded as feeding on the roots of strawberries, but what they could find in the house puzzled him.

The Elm-leaf Beetle, *Galerucella xanthomelaena*, has been very destructive in Long Island and in West Chester, many of the noble elms being so entirely stripped that their death is expected. Nothing entirely new has presented itself during the year.

From Mexico had been received specimens of seed, probably of a *Euphorbia*, known as the jumping seeds. The seeds apparently are formed in a pod, three in one inclosure. When placed on a hard surface they begin a series of the most erratic movements, tumbling from side to side, and sometimes making leaps of an inch or more. Inclosed in the seeds is a white, somewhat flattened larva, and the seed itself, a mere shell, is lined with reddish silk. Westwood has raised the larva to maturity and found an insect very closely allied to *Carpocapsa pomonella*, which he called *C. saltitans*. At about the same time Mr. Lucas, in France, also received the insect, and not knowing of Westwood's work, re-named the species. The entire life history of the species is not yet known: it is supposed that the insect deposits its egg on the young seed, and the larva, when very small, makes its way into it. No trace of an opening was now visible. Westwood and Lucas report the insect as obtained in February, but only a few days ago a specimen was caught flying in the room. The curious thing is the close resemblance to our *C. pomonella*, which

has no such habits. Referring to Mr. Smith's remarks on tuftings of the feet of Noctuidæ, *C. saltitans* is peculiar in having the tarsi hidden by long tufts of scales.

Mr. Dimmock says that *O. leucostigma* has not been abundant near Boston, and that the spring frosts affected the eastern rather than the western portion of the State.

Mr. Smith replied that on Cape Cod he had found the larvæ so abundant that they stripped the trees everywhere, and there had been frost enough to kill a large quantity of vegetation.

Dr. Horn said it is a remarkable fact that all of the Coleoptera mentioned by Prof. Lintner are imported species, and for the most part they have kept pretty close to the sea shore. It is interesting that they have commenced their journey toward the interior; it was to be expected, however, that eventually they would travel along the lines of their food plant, as did the potato beetle from west to east. At Washington he had noticed the elm tree stripped of their leaves. Another species, *Crioceris 12-punctata*, has of late been taken by Mr. Lugger around Baltimore. It is rather curious that the neighbourhood of Baltimore and Alexandria, with comparatively a very limited commerce, should still have yielded a proportionately very large number of imported species. Two species of *Blaps* have been introduced and first found near those cities, one *mortisaga*, and another not yet determined. Of *B. mortisaga* a friend said that a bushel could be taken from a single cellar in Alexandria. Another very curious matter is the very sudden spread of insects. When working over the Ryncophora some years since with Dr. LeConte, every collector was applied to for material, and from Mr. Fuller was obtained a little species, marked Montana, which was named *Aramiges Fulleri*, and was then the only known specimen. Suddenly, a year or two afterward, specimens were received for determination from all parts of the country, and everywhere complaint was made of injuries caused by the species, especially in hot houses. How happened it that for ages the beetle was unknown, an inhabitant of some remote locality, and suddenly it should spread all over the States?

Prof. Lintner said he had the species since 1876; that year it was abundant in green houses.

Mr. Dimmock had known the species for some years as very destructive to roses in hot houses.

Dr. Horn said he first obtained the beetle in 1874, or perhaps a little earlier.

Mr. Hulst, referring to Prof. Lintner's remarks on *O. leucostigma*, had noticed its comparative scarcity on Long Island. The elm beetle was common. Another pest not mentioned was a small insect apparently of the frog spittle nature on maple. Sometimes the trees were white with it, and many appeared dying off. A species of *Chrysops* was also common, and seems to have been destroying the pest.

Prof. Lintner had noticed the same insect; it is a Coccid, *Pulvinaria innumerabilis*.

Prof. Osborn said it is very abundant on maple. It can be subdued by cutting the infested branches before July. The young go first to the leaves. The female lives until spring, the male dies in the fall. No less than seven different species of insects prey upon this form.

Mr. Saunders said the insect had appeared in Canada and Michigan in large numbers, the trees being sometimes completely covered. On some trees the larvæ of *Chilocorus bivulnerus* were found feeding on them in such numbers that they had caused alarm; persons finding them supposed that they were the parents of the pest.

Mr. Underwood inquired whether this insect was not also found generally on elm. Mr. Rathvon had published an article on the subject, and had referred to its feeding on elm as a rarity. It had been observed also on grape and *Ampelopsis*.

Mr. Saunders had not observed it on elm in Canada.

Dr. Horn made some observations on secondary sexual characters of Coleoptera. He had been interested in Mr. Smith's studies on the external anatomy of Lepidoptera, and especially in the remarks on secondary sexual characters. Somewhat similar antennal structures were sometimes found in Coleoptera, but their uses in this order seemed better known. In *Collops* was a structure closely resembling that of *Renia*. Here there was the same excavated curved joint, at the base of which was an articulated slender spine-like appendage, and the upper part of the antennæ was capable of being folded backward.

The use of this was in copulation; the ♀ antennæ were grasped in this curve, the articulated spine closed the curve by being directed forward, while the anterior part of the antennæ was folded backward, thus tightly holding the ♀ antennæ. The form in *Meloe* is similar to that of *Herminia*, and without the articulate spine still serves the same purpose. In *Sphalera* and *Tomoxia* there is a double-jointed appendix to the last joint of the maxillary palpi which probably served the same purpose. These structures are explainable. Others are more obscure and not yet explained. For instance, *Lebia* has a notch on the inside, near the end of the middle tibia in the ♂. A species of *Aphodius* has a very curiously hooked first tarsal joint to the hind leg. Another species has a peculiar club-shaped appendage to the inner side of the fore tibiæ. What use these served was not yet satisfactorily ascertained.

Mr. Cresson said that except in the parasitic forms, there were no such characters in the Hymenoptera, and that group he had not studied.

Mr. Osborn stated that very interesting characters occurred in the Mallophagidæ, and especially one in *Lipeuris*, which much resembled that of *Tomoxia*.

Mr. Smith moved the appointment of a committee of three to arrange a programme and secure papers for the next meeting; seconded and carried. The committee appointed consisted of Mr. J. B. Smith, chairman, and Messrs. Herbert Osborn and B. Pickman Mann. On motion the Club then adjourned, to meet again under the rules at the next meeting of the A. A. A. S.

The President then delivered his annual address as follows:

ANNUAL ADDRESS OF THE PRESIDENT.

Gentlemen,—The working entomologist, ever on the watch and ready to note the many items of interest in connection with insect life, will seldom pass a season without finding many facts worthy of record, which, if not of general interest, are at least of local importance. While the year 1884 has not been marked by any unusual invasion of destructive insects, affecting our country as a whole and exciting general comment, yet many localities have suffered either from the unusual development of familiar forms of insect life, or from the introduction of new pests.

Early in the year some excitement was caused in the Ottawa district by the appearance of a very destructive caterpillar in great numbers in the clover fields, which rapidly devoured the foliage. This was at first supposed to be be an invasion of the veritable army worm, but on inspection it proved to be a very different insect. On the 23rd of May I had the opportunity of examining some of the affected fields in company with our Vice-President and Mr. W. H. Harrington. The caterpillars were exceedingly numerous, and much of the clover had been seriously injured by them. They were a species of cut-worm, the progeny of a moth known as *agrotis fennica*. This larva measured from $1\frac{1}{4}$ to $1\frac{1}{2}$ inches in length, had a dark yellowish brown head with a black stripe down the front, and a black body with two yellow stripes on each side, the upper one composed of streaks and dots of yellow, the lower, which was near the under surface, formed of two crinkled yellow lines which approached each other on the anterior segments and diverged posteriorly; on the upper part of the second segment was a black horny shield, the breathing holes on the sides were also surrounded with black.

The underside was brownish black, the feet and the fleshy prolegs, pale brown.

At the time of this visit the caterpillars were nearly full grown and it was observed that many of them were affected by a singular disease of a fungoid character which was destroying them very rapidly,—the diseased insects after death remaining extended on the leaves of clover or blades of grass in a natural position but somewhat discoloured. On handling them the skin was found to be quite tender and the body filled with a thin dark-coloured fluid, the result of the decomposition of the tissues. This disease spread very rapidly and was no doubt contagious. I collected some fifty or sixty specimens, all appar-

ently in a healthy condition, for the purpose of rearing them : these were placed in two separate boxes with a liberal supply of food ; within twenty-four hours a large number of them died, all apparently from this disease ; they were frequently examined, the diseased and dead were separated from the living, but within three days only four remained alive ; of these four only one survived to enter the chrysalis state, and this one did not mature the perfect insect, hence I am indebted to Mr. James Fletcher for the determination of the insect, who, being on the spot, succeeded in rearing several specimens of the moth.

A few days later complaints were made to me of the depredations of the caterpillar of another of our cut-worms, a species usually very common, the larva of a moth known to entomologists as *Hadena arctica*, which was very destructive to corn and other crops. A few days sufficed to mature the swarms of both these devastating armies, when these caterpillars, which had escaped both disease and enemies, buried themselves in the ground and changed to chrysalids which subsequently produced the winged moths.

Every season these cut-worms are a source of great annoyance to gardeners and farmers who find their young corn, cabbage, tomatoes, melons and other plants of succulent growth suddenly cut down by an unseen enemy and withered. Stalks of wheat and other grain are often cut in a similar manner by the same enemies, and they being universally distributed and extremely voracious, inflict enormous losses every year. They have received the name of cut-worms from their habit of cutting off near the base tender and succulent plants, and under this common designation there are included a number of species having similar habits, belonging chiefly to the genera *Agrotis*, *Hadena*, and *Mamestra*, some of which possess striking points of difference in the moth state, although they much resemble each other while in the caterpillar condition. The general history of these cut-worms can be given in a few words : The eggs are laid by the parent moths during the latter part of the summer, sometimes on the ground about the roots of grass and other plants, and sometimes on the leaves near the ground. Within two or three weeks young larvæ hatch from these eggs and by the time autumn sets in the caterpillars have attained the length of half an inch or more, when they burrow into the ground deep enough to protect them from injury by severe frost, and there remain in a torpid condition all the winter. The warmth of spring arouses them to activity, when they seek the surface of the ground feeding at night on almost any green thing they meet with, eating with apparently insatiable appetite as they approach maturity, and burying themselves during the day under the surface of the ground in the neighborhood of their depredations. When full grown they burrow in the earth to varying depths, and there change to chrysalids from which the mature insects escape in two or three weeks.

These insects are hurtful only while in the larval condition. As remedies, showering the plants with Paris Green and water, sprinkling them with air-slacked lime or powdered hellebore, or strewing lime or soot, or mixtures of these substances around the plants on the surface of the ground have all been recommended and in some cases have been found useful. Plants have also been protected from injury by these caterpillars by strewing around them a little dry sand impregnated with coal oil, in the proportion of a teacupful of coal oil to a pailful of sand thoroughly mixed ; the application should be renewed every week. This method of warding off the attacks of injurious insects by the use of odorous substances repugnant to them is rapidly growing in favour on account of the success attending its use. This coal oil remedy for cut-worms is said to be very effectual, and the cost of the application being so trifling its usefulness should be extensively tested. It is manifest that none of these measures are feasible where field crops are invaded, as the area would be too great for any one to undertake to cover with such material. In such cases nature has provided efficient remedies to reduce their numbers. Besides the disease to which I have referred, there are armies of parasitic insects which prey on them. Some of these directly devour their living prey, others deposit eggs within the bodies of their victims, which, hatching into grubs, consume them. Hence it often occurs that an insect which is very abundant one season is scarce the next.

These cut-worms are very widely disseminated. Early in July I received specimens from Manitoba from the Deputy Minister of Agriculture of a caterpillar belonging to this group, which was found to be seriously injuring vegetables, and in some localities

oats and barley also. This was a greyish-brown caterpillar with a semi-transparent skin, a brown horny head, and a shield of the same character on the upper part of the second segment. There was a pale line down the back, two similar lines along each side, and a white band lower down, close to the under surface. One of them was reared through all its stages, and produced a neat and rather pretty moth, known to entomologists as *Agrotis declarata.*

That destructive pest, the wheat midge, *Cecidomyia destructor*, which has entailed so much loss on our farmers in years gone by, has prevailed during the past season to a considerable extent throughout the western part of our Province. Alarming reports were sent to me from various districts, and on the 16th of July a tour of inspection was undertaken for the purpose of ascertaining the extent of the injury. During a drive of over 100 miles, in company with Mr. J. M. Denton, one of the members of our Council, the wheat fields were examined, and midge was found generally distributed, but nowhere in any very great numbers. Some varieties of wheat were much more injured than others, that known under the names of Michigan Amber and Egyptian seemed to suffer much. Among the varieties almost free from this trouble the Democrat wheat was one of the most esteemed. The selection of some of the best of the so-called midge-proof sorts for seed, the kernels of which harden so early in the season that the larva is unable to feed on them is assuredly one of the most practicable methods of lessening the depredations of this troublesome insect.

The Colorado potato beetle, *Doryphora decemlineata*, is still further extending its ravages. Having reached the Atlantic seaboard in the east its further progress in that direction has been arrested ; it is now extending its domain over the fertile fields of the North-West. Specimens have been sent to me this season from Portage La Prairie, where they are said to be confined to the neighbourhood of the town, and having been vigorously assailed with Paris green it is hoped that they have been pretty well exterminated. Through the kindness of Acton Burrows, Esq., the efficient Deputy Minister of Agriculture in Manitoba, I have received information of the appearance of this pest in the counties of Manchester and Dufferin in the same Province, but in none of these localities has the insect yet made much headway.

Grape growers in some sections of Ontario suffered much early in the season from injuries caused by the grape-vine flea-beetle, *Graptodera chalybea.* This insect, which is about three-twentieths of an inch long and varies in colour from a steel blue to green, passes the winter in the perfect state, hybernating under dead leaves and other rubbish, and awaking from its long slumber in early spring proceeds to satisfy its vigorous appetite by consuming the tender buds of the grape-vine just as they are swelling. These insects have been so plentiful in some vineyards that the crop has been almost destroyed. Where they prove troublesome they may be collected by spreading sheets on the ground under the vines and jarring the canes early in the morning when the beetles are in a torpid condition, or they may be poisoned by syringing the swelling buds with Paris green and water.

The plum curculio, *Conotrachelus nenuphar*, continues its mischievous work in most parts of the Province where plums are grown, and the labour attending the jarring of the trees for the purpose of capturing and killing the insects deters many from undertaking the cultivation of this useful fruit. From the evidence thus far obtained it would appear that the remedy which has been found so efficacious in subduing the codling moth of the apple, namely, Paris green and water, in the proportion of a teaspoonful of the poison to a pailful of water, will also protect the plum crop from the ravages of curculio. This remedy should be extensively tried by thoroughly syringing the trees with it as soon as the fruit has set, and repeating the application in a few days should rain occur to wash it off. Should this remedy prove uniformly successful a great stimulus will be given to plum culture. During the past season the plum crop on my own grounds was a failure, the trees having had but very few blossoms. In the absence of plums the curculios deposited their eggs freely on the pears, manifesting a special fondness for Clapp's Favourite. Although I watched them carefully, I failed to find a single example where the insect matured in this fruit. The only effect observed was a slight disfigurement in the form of the fruit and the production of a hard spot where the incision was made

While collecting moths at sugar early in the season I observed one evening about nine o'clock among the insects which came to sip the sweets two specimens of the plum curculio. I captured one of them, the other fell to the ground before I could secure it. Experiments made by me some years ago proved that this insect is active at night as well as in daylight, but this is the only instance I have known of its being attracted to sugar at night.

From one locality complaints reached me about the middle of June last of the abundance of a spiny caterpillar feeding on currant bushes, which my correspondent supposed to be a new currant worm. Specimens were forwarded and proved to be the caterpillar of the gray comma butterfly, *Grapta progne*. This insect may be found almost every season in limited numbers on the wild gooseberry and currant bushes in open woods, and occasionally on the cultivated varieties, but this is the first instance to my knowledge where the insect has appeared in sufficient numbers to cause injury. They are so very subject to parasites that it is not at all likely they will ever prove generally destructive; syringing the bushes with Paris green and water or dusting the foliage with powdered hellebore will soon make an end of them.

In the neighbourhood of Drummondville several acres of red raspberries were stripped of their foliage by the larva of the raspberry saw-fly, *Selandria rubi*; reports of injury from this pest have also been received from several other localities. It is a green worm which is so exactly of the colour of the young foliage it feeds on that it frequently escapes detection. When examined, this larva is found to much resemble that well known pest, the currant worm, but it has no black dots. If allowed to pursue their course they soon riddle the leaves, leaving little more than a net-work of the coarser veins. An application of hellebore mixed with water in the proportion of an ounce of the powder to a pailful of water speedily destroys them.

A new clover insect has recently invaded our Province which promises to be troublesome. It is a small curculio known to entomologists as the punctured clover leaf weevil, *Phytonomus punctatus*. It is said to have been introduced from Europe within the past few years. The late Dr. LeConte, in a work published in 1876, reports having received one specimen from Canada; but at that time nothing seemed to have been known of its habits. In 1881, Prof. Riley published in the *American Naturalist* an account of the injury done to clover fields in Yates county, New York, by this insect; in one instance in a patch of two acres scarcely a whole leaf remained. The beetle is about two-fifths of an inch long, of a dark-brown colour, marked with dull yellow, and has its wing cases thickly punctured. Each female is said to deposit from 200 to 300 eggs, which are sometimes laid on the surface of the leaf stem, but more frequently thrust into the interior of the older stems. The young larvæ may be found as early as in May, but being small they do not usually attract notice until almost a month later. At first they feed among the folded young leaves or attached to the under side of a leaf. When approaching full growth, they feed chiefly on the margins of the leaves, into which they eat irregular holes. At this period they are not easily seen as they relax their hold and drop suddenly to the ground when approached; moreover, they feed chiefly during the night and hide in the day-time among the roots and stalks of the plants. When full grown the larva spins a small cocoon, which is usually placed a little below the surface of the ground, in which it changes to a chrysalis; about three weeks later the beetle escapes. From observations which have been made on this insect at the Department of Agriculture in Washington, the average period required from the time of the depositing of the egg to the escape of the mature beetle, is three and one third months, hence in most localities there will be two broods during the summer. Mr. A. H. Kilman, one of our members, residing in Ridgeway, was the first to report the occurrence of this pest in Ontario, which he says was wafted to our shores by prevailing east winds about the 10th of August last. On this date the beetles appeared on the opposite side of Lake Erie, in Buffalo, in such multitudes that thousands of them were crushed on the pavements by the feet of passers-by. Mr. Kilman says "I picked them from the fences and sidewalks, and found them in the grass in my lawn: I am of opinion that they will go into winter quarters here, and open up a lively campaign in the spring. Whatever the sequel may show, I fear that these invaders will prove of better staying qualities than those who crossed the border in '66 and turned

to the right-about at Ridgeway, because Canada was not the "clover patch" they were looking for.

As the larvæ will be found most numerous in the latter part of May or early in June, it is recommended that the clover should be heavily rolled at that time, for the purpose of destroying them. If badly infested fields were ploughed about this period the destruction of the insects would be still more certain.

Early in the summer alarming accounts were received of another insect injuring the maple trees, especially the shade trees on streets and avenues. This was a species of coccus or bark-louse, *Pulvinaria innumerabilis* which forms brown scales on the branches, from under one end of which there protrudes a cotton-like substance forming a tuft about four times as large as the scale in which the eggs of the insect are lodged. In a short time there issue from this egg-nest a multitude of minute yellowish white lice, which distribute themselves over the branches, and, locating on the succulent portions, pierce the tender bark with their sharp beaks and subsist upon the sap. These young lice soon become stationary, gradually increase in size, and reach maturity towards the end of the season. They chiefly affect the underside of the limbs and branches.

Remedies.—The branches may be rubbed with a stiff brush or broom which will dislodge many of the insects, and then washed with a liquid made of soap diluted with lye, or solution of washing soda; or with an emulsion of coal oil made as follows: take one pint of coal oil and agitate vigorously with an equal quantity of milk until the compound assumes a creamy appearance, when it should be diluted with about ten times its bulk of water and applied with a brush or syringe.

This pest has occurred in many localities in Western Ontario, also in Michigan, New York and Pennsylvania.

That cosmopolitan butterfly known as the painted lady, *Pyrameis cardui*, has been very abundant the past summer, not only in Canada but also in most of the northern United States. From Mr. Burrows I learn that in Manitoba the larvæ appeared in such countless hosts as to cause much alarm, and reports were current of their having injured some of the growing crops. This, however, is improbable, as it devotes its attention mainly to devouring thistles, occasionally specimens have been found feeding on mallow, hollyhock, wild sunflower, burdock and several other plants, none of which however are of any economic value.

A lively interest is being awakened in reference to the insects inhabiting our northwest Territories and British Columbia, of which we as yet know comparatively little. Captain Gamble Geddes, of Toronto, has made excursions to several of these distant points, and brought home many rarities. From the Moose Mountain district, in the Province of Assinaboia, a number of interesting specimens have been received, collected by Miss F. M. Pierce. Prof. Panton, of Winnipeg, has been collecting in that neighbourhood, and in British Columbia we have a most efficient helper in the person of Rev. G. W. Taylor, who has recently published in the *Canadian Entomologist* lists of some of his captures in the neighbourhood of Victoria. It is sincerely hoped that other observers will be induced to labour in these most interesting and promising fields.

On the 30th of January last the House of Commons at Ottawa resolved to appoint a select committee to enquire into the best means of encouraging and developing the agricultural industries of Canada. Circulars were prepared by the committee, embracing a series of questions, which were sent to most of the prominent agriculturists and scientific men in the Dominion, to which several hundred replies were received. The practical bearing of entomology on agriculture was fully recognised by the committee, and the questions so framed, that a very large amount of information on this subject was gathered. Our Vice-President, Mr. James Fletcher, was summoned to give evidence in reference to injurious and friendly insects, so also was Mr. W. H. Harrington. A report has been issued covering 218 pages containing the evidence, and a summary of the replies to the questions. It is gratifying to find that the close relationship between entomology and successful agriculture is beginning to be more fully realized, and that the work of our Society and the efforts of entomologists generally are so well spoken of as they are in this document.

Continued efforts are being made by our Society to obtain and disseminate correct

information, especially in reference to those insects injurious to agriculture; with this in view we have lately issued a number of blank forms for describing insects, which will be sent to any one desiring them on application to either of the officers in London. By this means we hope to secure fuller details and more uniform descriptions of insect pests, so that they may be more readily determined. The officers and members of the Council have also embraced every opportunity afforded them of visiting localities specially affected by destructive insects, and have endeavoured to disseminate among the sufferers practical information in regard to the most effective remedies for such evils. The demand for our Annual Reports from all parts of the world has much increased since the publication last year of the general index. It is a matter of regret that the issue of several of the earlier reports is entirely exhausted, and there is now no means of supplying the demand. Our monthly journal, now in the sixteenth year of its existence, continues also to grow in public favour.

During the past year reports of great value in reference to destructive insects have been published by the Department of Agriculture, at Washington, under the able direction of Prof. C. V. Riley; a most excellent and voluminous report from the pen of Prof. J. A. Lintner, State Entomologist, has been printed and distributed by the State of New York. Much useful work has also been accomplished in the same direction by Prof. A. S. Forbes, State Entomologist of Illinois; by Prof. Herbert Osborn, of the Iowa Agricultural College, and others. Many additional parts have appeared of that superbly illustrated work on North American butterflies, by Mr. W. H. Edwards; the same talented author has also now in the press a revised catalogue of the butterflies of North America. The recent meeting of the Entomological Club of the American Association for the Advancement of Science, held in Philadelphia, was one of unusual interest, most of the leading Entomologists on this Continent being present. A full report of the proceedings has been prepared.

In concluding, permit me to urge upon you all renewed diligence in your studies of insect life, be patient and faithful in observing, be prompt in publishing the results of your observations. The field we labour in is so vast that life is too short to permit any one of us to do much, especially when the limited time is taxed by other pressing engagements. Nevertheless, let us do what we can to unravel the mysteries relating to these much-despised atoms of existence, the opportunity is ever before us.

> "Ten thousand forms, ten thousand different tribes,
> People the blaze of day,"

and when the brightness of the sunshine has faded there are tribes equally numerous and attractive which rise not from their couch until their more obtrusive brethren have retired to rest. Whether it is ours to employ portions of the night or the day in this charming occupation we shall not in either case fail to find manifested in the beauty of form and in the instincts with which these tiny creatures are endowed, manifold evidence of the wisdom and goodness of the great Author of Life.

ELECTION OF OFFICERS.

The following named gentlemen were then duly elected as officers of the Society for the ensuing year:—

President—William Saunders, London, Ontario.

Vice-President—James Fletcher, Ottawa, Ontario.

Secretary-Treasurer and Librarian—E. Baynes Reed, London, Ontario.

Council—Rev. C. J. S. Bethune, M.A., Port Hope; Rev. T. W. Fyles, South Quebec; W. H. Harrington, Ottawa; J. M. Denton, London; J. Alston Moffatt, Hamilton.

Editor "Canadian Entomologist"—William Saunders, London.

Editing Committee—Rev. C. J. S. Bethune, J. M. Denton, James Fletcher and E. Baynes Reed.

Auditors—W. E. Saunders and H. P. Bock.

Delegate to "Royal Society"—W. H. Harrington.

On motion of Mr. James Fletcher, seconded by Rev. T. W. Fyles, a vote of thanks was unanimously tendered to the President, Mr. William Saunders, for his able and interesting address.

In proposing this vote Mr. Fletcher said that he should like to make a few remarks concerning some of the subjects alluded to in the address, particularly with regard to the cut-worms referred to in the earlier part, which he had specially investigated by instruction of the President, and upon the occurrence of which he had prepared a short note for the Society. He stated that the injury done by *Agrotis fennica* at Ottawa in the month of May last was very great. He had received reports of its ravages early in the month, and in all cases those enquiring for remedies stated that the insects were new to them. The first specimens sent were taken in large numbers under strawberry plants, and were about half an inch in length. After a few days reports came in *from all quarters of their devastation*, which was worst about the 22nd of May, when, the President being in Ottawa, he had, together with Mr. Harrington and himself, visited one of the most seriously injured farms, two miles from Ottawa, where they had found the larva in vast numbers attacking the clover in a field of fodder, but leaving untouched the rye which was growing with it. At first it was supposed by the farmers that the insect was the army-worm, but the larva upon examination was found to be quite different, being of a deep velvety black with indistinct white lines. It was found to be chiefly nocturnal in its habits, and to possess characteristics of the ordinary cutworms, lying hid beneath the surface during the day and destroying everything within its reach at night. They were also climbing cut-worms, and had done much damage by eating out the leading shoots in some young trees. Mr. Fletcher was growing from the seed for examination, oak, black walnut, horse chestnut, elm, negundo and maple; all had suffered. It seemed that during the last stage the larvæ were much more active during the daytime, and did not hide under the surface. Just before the pupal stage an enormous fatality was caused by a fungous disease which attacked the larvæ and which caused them to decay very rapidly. In certain fields they could be seen in large numbers on stems of grasses and other plants which they had crawled up, and to which they were fixed by the fungus, which seemed in nearly all cases to develop just below the head in the shape of a small tuft of white downy matter. After a short time the bodies dried up. Large numbers had also fallen a prey to parasites, and as many as three ova of a *Tachina* fly had been found on some specimens. Mr. Fletcher had only succeeded in rearing about a dozen imagines, nor had the moth been very common during the summer, although a few had been taken.

With reference to the Manitoba cut-worm referred to by Mr. Saunders, he had succeeded in bringing to chrysalis three of the four larva sent to him by Mr. Acton Burrows, the Deputy Minister of Agriculture for Manitoba. Of these, when the moths emerged, one proved to be *Agrotis devastator*, and the other two had been sent to Mr. J. B. Smyth, of New York, for identification. They were very dissimilar in colour, but the markings seemed the same on each.

Mr. Fletcher also stated that during the month of July he had found a small *Phytonomus* committing great damage in the clover at Dalhousie, New Brunswick.

He had taken it for *P. nigrirostris* at first, but fancied it might be a different species, as nearly all the specimens bred were light cinnamon brown in colour.*

He found that its habits differed considerably from those of *P. punctatus*, as described in Professor Lintner's first report. He had brought specimens for the members, and as he had prepared a note of the insect for the Society he would not say more then. He had found a cocoon on clover at Brome, in the eastern townships.

* Since identified as *Phytonomus nigrirostris.*

Mr. J. Alston Moffatt here exhibited specimens of the true *P. punctatus*, which he had received from Mr. Kilman, Ridgeway.

Resuming his remarks, Mr. Fletcher said that he had observed enormous damage done by the larch saw-fly, *Nematus Erichsonii* ; he had first noticed it near Quebec, and had traced it all down the Intercolonial Railway wherever any larch trees occurred, as far as Dalhousie, where he found it abundant. He exhibited interesting specimens of young twigs of *Larix Americana*, which he had received the previous week from the Rev. Mr. Fyles from Quebec, in which the leaves of the tree, although eaten down to the base by the larvæ, had later in the season, after the attack ceased, been able to grow about a quarter of an inch. Mr. Fletcher thought that this fact that the tree was able to produce this after crop of foliage was one of very great importance, as the tree might by this means be able to withstand the insect for a much longer period ; he anticipated that some remedy either artificial or natural would be found before long.

He exhibited a small *Hemipteron*, *Podisus modestus*, which he had found destroying the larvæ at Brome, Que., on the estate of S. A. Fisher, Esq., M.P., who had given him assistance and provided him with facilities for examining this pest.

The Rev. T. W. Fyles, of South Quebec, said it afforded him much pleasure to second the vote of thanks to their President. Referring to the fungous disease upon the cut-worms mentioned by Mr. Fletcher, he said that he had known in England many years ago of an insect similiar to this being attacked by some such disease as had been described. He spoke of the habits of the cut-worms, saying that as they did not tunnel their way from plant to plant but passed over the surface, a circle of salt placed round each plant at a short distance would probably save it : the larvæ would shun the salt. Besides this, there was the remedy of "hilling up" the plant ; he had found that the larvæ would not climb a mound on account of the particles of earth giving way. He believed that salt in the early stages of the plants and the mounds of earth afterwards would amply protect corn, etc., from the attacks of the insects.

He next spoke of the potato beetle *D. decem-lineata*, and expressed his belief that its numbers and vigour were decreasing in the Province of Quebec. He stated that there were places on the Lower St. Lawrence where it had not appeared.

He next remarked that *Nematus Erichsonii*, the larch saw-fly, had extended its ravages along the Beauce Valley to the neighbourhood of Quebec where it had stripped the tamaracks (larch) bare. A second growth of leaves had appeared, and this probably would save the trees. If, however, the attacks were repeated to the same extent, he believed the trees would die. Mr. Fyles shewed specimens of the insect and of its cocoons.

Mr. J. Alston Moffatt, of Hamilton, stated that he had lately received from his friend, Mr. J. B. Hay, of Brantford, some specimens of a beetle that had been found attacking hot-house plants, *abutilon*, roses, *plumbago*, etc. The insect being new to him, he sent it to Dr. Horn for identification and received the following letter from him :

PHILADELPHIA, P.A., Oct. 10, 1884.

DEAR SIR,—The insect you send is *Aramiges Fulleri*, Horn (Fuller's rose beetle). It is widely scattered over the country and has been reported to me as damaging many hot-house plants, particularly the thick leaved varieties. It seems a great nuisance and eight years ago appeared to be rare.

G. H. HORN.

Specimens of this insect were exhibited by Mr. Moffatt.

The President in referring to the work of the special committee appointed by the House of Commons in February last to enquire into the condition of agriculture said that the members would be much pleased to learn that as one of the results of that enquiry Mr. Fletcher had been appointed Honorary Entomologist to the Dominion Department of Agriculture. It was much to be desired that this appointment should become permanent, for the Society cordially recognized the special fitness of Mr. Fletcher for this important position, and believed that he would accomplish much good work in this connection.

Mr. Reed exhibited a coloured photograph presented to the Society by Mr. Alfred Wailly, an English member of the Society, representing an extraordinary aberrant form of *Attacus cecropia*.

Mr. Fletcher stated that he was happy to announce that during the past summer, under instructions from Dr. Selwyn, F.R.S., Director of the Geological Survey of Canada, an interesting collection of Lepidoptera had been made in the Lake Nipigon region by Prof. Macoun and Mr. William Macoun, and that these having been submitted to him for identification he had found many very valuable insects included, among which he made special mention of two species of *Chionobas*, *Colias Eurytheme*, *Colias Interior*, a species of *Chrysophanus*, which was possibly new, and *Alypia MacCullochii*. By means of these instructions to the surveyors it was hoped that much useful information would be obtained of the insect fauna of those newer parts of the Dominion that were being explored and opened up for occupation.

Mr. Fletcher remarked that we have heard a good deal of rubbish in the newspapers, etc., about nothing being done by the members of the Geological Survey; he hoped that it was unnecessary to say that these reports were entirely without foundation, and at any rate the present action of the director would prove to all entomologists that he appreciated the value of their scientific researches.

The evening being somewhat advanced, the Society adjourned until 9 o'clock next morning.

The Society re-assembled Thursday morning at 9.30. The President in the chair.

Mr. W. H. Harrington stated that *Phytonomus nigrirostris* occurred in considerable numbers in the vicinity of Ottawa, but that he had not found any evidences of the destructive habits described by Mr. Fletcher. It was, however, known to attack clover in Europe.

He mentioned several insects found by him on Larch such as *Urocerus flavicornis* and *Buprestris maculiventris*. During the previous summer he had in company with Mr. Fletcher, noticed a grove of tamarac with trees in various stages of health and decay and the cause of the latter seemed undoubtedly to be a species of *Dendroctonus*, which was found in immense numbers under the bark of sickly and dying trees. The bark was completely undermined and riddled by its galleries and swarmed with larvæ, pupæ and beetles.

Associated with these were large numbers of a smaller bark-borer—*Hylesinus opaculus*—with one or two other species which would not be likely from their habits or numbers to do much injury. Examination of dead trees shewed that the bark had been destroyed in the same manner, but now contained no beetles.

In reply to a question as to whether such bark beetles ever attacked living and healthy trees, Mr. Harrington answered in the affirmative, and instanced a species which he had during the spring found boring into and through the terminal buds of *Pinus strobus* (white pine) and thus destroying them.

Mr. Harrington exhibited a small collection of about fifty species of Coleoptera taken by him at Sydney, Cape Breton, during a visit of a few days in September, also specimens of the Chinch bug which he had found abundant there; he also exhibited a *Chalcophora liberta* with deformed thorax, a *Trogosita mauritanica* with malformed head, and a wasp (*Vespa ?*) with one of its antennæ curiously deformed.

Rev. T. W. Fyles shewed specimens of *Colias Eurytheme*, *Pamphila Manitoba*, *Pyrgus Centaureæ*, a female of *Smerinthus Cerysii*, and other rare insects.

Mr. J. Alston Moffatt shewed a collection of rare and interesting insects both Lepidoptera and Coleoptera.

Mr. Fletcher exhibited a collection of forty specimens of *Colias Philodice*, shewing many curious variations.

Two specimens of *Colias Eurytheme*, one of which was the autumn form bred from the egg.

Two specimens of a small moth bred from larvæ found boring in the flowers and capsules of *Nelumbium luteum*, at Chicago.

A specimen of *Sphinx luscitiosa*.

An *Hepialus* taken at Dalhousie, N.B., very similar to *H. Argenteo-maculata*, but smaller, and having four spots on the primaries.

Two specimens of a *Chrysophanus* taken by Mr. W. Macoun at Nipigon.

Specimens of *Agrotis fennica*, and other rare Lepidoptera taken during the past season.

Rev. T. W. Fyles exhibited specimens of mud wasps nests, taken at Compton, from which he had obtained grubs that produced a species of *Ptinus*.

Mr. J. M. Denton shewed some Philadelphia raspberry canes which were badly injured by some borer not determined.

The President exhibited two boxes of insects which had been lately received from Miss F. M. Pierce, of Moose Mountain, Assiniboia, who had sent the specimens as a first collection. The boxes proved of great interest to the members present.

The Secretary exhibited the beautiful silver medal which had been awarded to the Society by the International Fisheries Exhibition. The medal was much admired.

In presenting a collection of Diurnal Lepidoptera from Rev. G. W. Taylor, of Victoria, Vancouver Island, Mr. Fletcher stated that he considered one of the chief advantages of having the annual meeting at London was, that the members could see in what species the Society's reference collection was deficient, and he was sure that they all felt the necessity of making the collection as complete as possible; for his own part he would much prefer giving any unique specimens he might take, to the Society, rather than have them hidden away in his collection where only a few could see them. He had now very much pleasure in presenting a small but valuable collection of specimens to the Society from his friend Mr. G. W. Taylor, of Victoria, B.C. Mr. Taylor, although one of our new members, had already done good work. Mr. Fletcher also distributed among the members a packet of duplicates sent for that purpose by Mr. Taylor, among which were specimens of a *Melitæa*, provisionally named *rubicunda*, but which were not considered typical by Mr. W. H. Edwards. Of this species, however, Mr. Fletcher had received larvæ, some of which were in his own hands, and some had been forwarded to Mr. W. H. Edwards.

The President expressed the pleasure Mr. Taylor's liberality had given him, and the gratification he felt that the Society's collections were so much appreciated. A vote of thanks was given to Mr. Taylor for his donation.

Mr. Harrington stated that *Oberea tripunctata* had been found very abundant at Ottawa. He remembered it also as being general in 1878.

Mr. Reed called attention to an extract from a newspaper shewing that railroad cars may often be the vehicles of carrying destructive moths from one part of the country to another; the extract stated that the writer was often struck by the number of *aletia* on the trains, and that he had observed that there was a sort of coincidence last season between lines of railroad and abundance of cotton worms.

Mr. Reed said that he had noticed fewer specimens of *aletia* this year than for some seasons past, although a few had within a few days been caught in his residence.

Mr. Reed also said that *Ægeria acerni* had been very prevalent in the neighbourhood of London this season.

Rev. Mr. Fyles reported that *Ægeria tricincta* had been taken at Como, P.Q., and also that he had taken two larvæ of *P. satellitia*.

Mr. Fletcher shewed a specimen of *Notodenta americana*, bred from larva found on basswood that had emerged from the pupa in autumn instead of spring; he also reported the capture at Ottawa of *Ellema Harrisii*.

An interesting discussion then took place on the transmission of insects through the mail and the best method of relaxing specimens.

In answer to Rev. Mr. Fyles, Mr. Fletcher said that we had not in Canada any plant which could be used as a substitute for the Laurel so extensively used by European entomologists, not only for killing the insects but for keeping them for a long time in a relaxed condition without spoiling. He had tried the young leaves of some of the different species of wild cherry which contain prussic acid, but had found that although it killed the insects it soon became mouldy.

Mr. Reed had found moist sand an excellent means of relaxing lepidoptera and boiling water for coleoptera.

The meeting finally passed a resolution requesting Mr. J. Fletcher to prepare for the

use of the members a short circular giving instructions for relaxing specimens, and also the best plan of packing them for transmission through the mail.

This Mr. Fletcher undertook to do, remarking that he himself had found the process of nature-printing a very useful mode of sending lepidoptera for identification.

The Rev. Mr. Fyles read a paper describing the habits of an insect forming galls upon *Vaccinium Canadense*, and exhibited specimens and microscopic drawings of the insect.

Mr. Harrington read an abstract of a paper on the *Tenthredinidæ*, or saw-flies.

Mr. Fletcher gave an abstract of a paper he had prepared, detailing some experiments he had made in breeding some *Colials* from the egg. He said he thought that the thanks of the Society were especially due to Mr. W. H. Edwards for his most valuable papers published in the *Canadian Entomologist* during the past year, and he was of opinion that they could not fail to have important results.

Having been induced himself by these articles to take up this fascinating branch of entomology, the results had been such that he considered them worthy to bring before the members at this meeting. He had been fortunate enough to secure a very much worn female of *Colias Eurytheme*, summer form *Eurytheme*, from which he had succeeded in breeding a lovely female specimen of the autumn form *Keewaydin*.

Thinking it would be interesting to compare the larvæ, stage by stage, with *C. philodice*, he had obtained 12 eggs of that species from a typically marked yellow female, on the same day as the eggs of *C. eurytheme* were laid, and he gave a short account of the differences noted between these larvæ at the different moults, and exhibited a beautiful series of specimens of *C. philodice*, drawing attention to the different variations in the markings. The brood of 12 bred at the same time as *C. eurytheme* were very interesting, consisting of three males, four ordinary yellow females, three albino females and one yellow female with very dull markings; one larva was destroyed by the larva of a *Tachina* fly.

Rev. Mr. Fyles read an interesting paper on the *Neuroptera* and their relation to the fishing interests.

Also, a paper on the occurrence in the Province of Quebec of the Croton bug, *Ectobia Germanica*.

The President then read an interesting paper from Mr. G. J. Bowles on ants.

The meeting decided that these papers should be submitted for insertion in the Annual Report.

Mr. W. A. Macdonald, agricultural editor of the *Farmer's Advocate*, took the opportunity of expressing the pleasure he had derived from listening to the interesting discussions which had taken place during the meetings, and to the vast amount of information thus given. He had found these meetings so profitable that he hoped to have the pleasure of attending them another year. The Entomological Society of Ontario, he said, was doing a good work in gathering and distributing information in reference to the many insect pests which our farmers and fruit-growers have to fight with, and he should be glad to render it any assistance in his power.

The meeting then adjourned.

POPULAR PAPERS ON ENTOMOLOGY.

SMERINTHUS EXÆCATUS AND MYOPS.

BY W. SAUNDERS, LONDON, ONT.

Among the most beautiful of all the night-flying moths may be placed those belonging to the genus *Smerinthus*, one of the genera included in the *Sphingidæ*, or Sphinx moths, a name derived from a fancied resemblance some of the caterpillars bear in certain attitudes to the famous Egyptian Sphinx. This family comprises some of the most robust and powerful among moths. Dr. Harris thus speaks of them: "In the winged state the true Sphinges are known by the name of Humming-bird Moths, from the sound which they make in flying, and Hawk Moths from their habit of hovering in the air while taking their food. These Humming-bird or Hawk Moths may be seen during the morning and evening twilight flying with great swiftness from flower to flower. Their wings are long, narrow and pointed, and are moved by powerful muscles. Their tongues when uncoiled are for the most part excessively long, and with them they extract the honey from the blossoms of the honeysuckle and other tubular flowers while on the wing."

The Blind-eyed Sphinx, *Smerinthus exæcatus*, which is well shown in Fig. 1, is a lovely creature which measures when its wings are spread nearly three inches across. Its body is fawn coloured, with a chestnut coloured stripe on the thorax and a dark brown line on the abdomen. The front wings are fawn coloured, clouded and striped with a rich velvety brown. The hind wings are rose coloured in the middle, crossed by two or three short whitish lines, having a brownish patch at the tip and a black spot with a pale blue centre near the inner angle. The moth is on the wing in June and July; the eggs are laid on apple, plum and wild cherry trees, and the larva, Fig. 2, becomes full grown in September. It then measures about two and a half inches long, has a green triangular head bordered with white, and an apple green body, paler on the back, deeper in colour along the sides, with seven oblique stripes on each side of a pale yellow colour, the last one, of a brighter yellow than the others, extending to the base of the horn. The skin of the body is roughened with numerous white-tipped granulations, and the stout horn on the hinder part of the body is of a bluish green colour. This larva when irritated emits a peculiar musical chirping sound.

Fig. 1.

Fig. 2.

When full grown it buries itself in the earth, where it changes to a chestnut brown chrysalis, which is smooth, with a short, rough terminal spine. In this condition it remains during the winter, escaping as a moth early the following summer.

The life history of the Purblind Spinx, *Smerinthus myops*, Fig. 3, is very similar to that of the species just described. It appears in the perfect state also in June and July. The moth is very handsome. The head and thorax are chocolate brown with a purplish tinge, the thorax is striped with yellow and the abdomen brown marked with yellowish spots. The fore wings are angulated and excavated on the hind margin, and are ornamented with bands and patches of black on a chocolate-brown ground, The hind wings are dull yellow with the outer half a rich brown, and have an eye-like spot towards the inner margin, black with a pale blue centre.

Fig. 3.

The caterpillar much resembles Fig. 2. It is green with two rows of reddish brown spots on each side and six oblique yellow lines, with two shorter lines of the same colour on the anterior segments. The head is bluish green, margined with yellow, and the curved horn at the tail green, tinged with yellow at the sides. When full grown it measures about two inches in length, and is nearly cylindrical in form. It feeds on the leaves of the cherry tree, both the wild and cultivated varieties.

The insect passes the winter in the pupa state under the earth; the chrysalis is smooth and of a dark brown colour. Both these insects are comparatively rare, and have never, as far as we know, appeared in sufficient numbers to prove injurious to the trees on which they feed.

Pulvinaria Innumerabilis—*Rathvon.*

This insect, which has commonly been known as the Grape-vine Bark-louse, might with perhaps greater propriety be now designated the Maple-tree Bark-louse, for the reason that it has been more frequently found on maples, and has inflicted more injury on these trees than it has on grape-vines. The great abundance of this insect during the past season has called general attention to it and elicited many enquiries in reference to its history and habits; indeed, in many sections of Western Ontario, as well as in the adjoining States of Michigan and New York, it has appeared in such swarms as to endanger the lives of the trees attacked. Branches have been sent to us so thickly covered with the insect in its various stages of growth that they could not be handled without crushing some of the numerous population.

Fig. 4.

The earliest description of this insect was given by Dr. S. S. Rathvon, of Lancaster, Pa., in 1854, who at that time gave the results of several years' observation on this species, which had occurred in his neighbourhood on Basswood or American Linden trees (*Tilia americana*). He found them to swarm in such countless hosts that he gave the insect the significant name of *innumerablis*. The late Dr. Fitch next published an account of it in the Transactions of the New York State Agricultural Society for 1859, since which several authors have figured and described this insect; but its life history was not fully unfolded until taken in hand by the late lamented J. D. Putnam, of Davenport, Iowa, who published in 1879, in the Report of the Davenport Academy of Sciences, a most elaborate and complete description of its life history, illustrated with two plates crowded with figures representing the various stages of development, all drawn by himself from nature. To these several publications we are mainly indebted for the facts here presented.

This bark-louse appears first in the form of a brown scale, from which, as it increases in size, there is protruded from the female scale cylindrical white filaments of a waxy nature, in which eggs are laid, and these cotton-like filaments, as new fibres are secreted, are constantly pushed further back until there protrudes a bunch about four times as large as the scale, as shown in fig. 4, which is thickly crowded with

eggs. Permeating through the nest is a quantity of powdery matter which under a high magnifying power is seen to be in the form of rings. The waxen filaments are adhesive and elastic, and can be pulled out sometimes a foot or more before entirely separating. When heat is applied these fibres melt, and their waxy nature is further demonstrated by their solubility in ether and chloroform. A single nest will seldom contain less than 500 eggs, and sometimes upwards of 2,000. The female begins to lay eggs in the latter part of May, and continues laying from five to seven weeks, until she dies from exhaustion, her entire life continuing for about thirteen months. During the laying and hatching of the eggs she secretes a quantity of a sweet liquid known as honey-dew, which attracts ants, flies and other insects, and it often happens that the young lice crawl up the legs and bodies of these visitors, by whom they are thus carried to other trees.

The newly hatched, yellowish-white lice soon distribute themselves over the branches, and attaching to the succulent portions, pierce the tender bark with their sharp beaks and subsist upon the sap. They shortly become stationary, when they gradually increase in size and finally reach maturity.

The scale of the male insect is very different from the female. It is longer in proportion to its size, and there are no waxy filaments projecting from it. When fully mature the insect escapes from its scaly covering and appears as a minute, beautiful and delicately formed two-winged fly, marked with yellowish and chestnut brown, with brilliant rose-coloured wings which also reflect the colours of the rainbow. These flies do not appear until August and September, and their lives in the winged state are very short, not exceeding two or three days.

Besides the maple and the grape, these insects are, as already stated, also found on the linden or basswood, and sometimes on the elm. Where permitted to continue their depredations undisturbed, they weaken and injure, and occasionally destroy the trees attacked. They affect chiefly the under side of the branches and twigs.

REMEDIES.

The branches of the infested trees may be vigorously rubbed with a stiff brush or broom, which will dislodge many of the insects, and then coated with a strong alkaline wash made by melting either soft or hard soap and diluting it to the consistence of paint with a strong solution of washing soda; or they may be destroyed with an emulsion of coal oil made by agitating vigorously and for a considerable time one pint of coal oil with an equal quantity of milk, until the mixture assumes a creamy appearance, when it should be diluted with about ten times its bulk of water and applied with a brush or syringe.

BRIEF NOTES OF A TRIP TO POINT PELEE, WITH ADDITIONS TO OUR LIST OF CANADIAN BUTTERFLIES.

During the summer of 1882, I paid a flying visit to Point Pelee, in company with some friends who were interested in botany. This point of land extends directly south into Lake Erie, near the eastern boundary of the County of Essex, and is among the most southerly points in the Province of Ontario. On the west side of the Point the land is chiefly marsh until near the extremity, and is a prolific hunting ground for sportsmen in search of water-fowl: it is also a breeding place for millions of Neuropterous insects. The east shore is sandy, and between this and the marsh are several farms and a considerable area of uncultivated arable land more or less covered with woods.

We reached Essex Centre, on the Canada Southern Railway, the nearest point of access by rail, at 7 p.m., on the 28th June, where we hired a vehicle and driver for three or four days, and drove that evening over an excellent road 18 miles to Leamington. The night was spent here and an early start made the next morning for the Point. A drive of about three miles brought us to the base of the Point, and after a journey of about eight miles farther, we reached the upper extremity.

The day was warm and pleasant, and during the last portion of this drive we saw more dragon-flies and other Neuropterous insects than we had ever seen in our lives before; they literally swarmed everywhere, especially in sunny spots. They flew in our faces and

buzzed about our ears as we were driving, and settled on our clothing in considerable numbers. After catching all that could be conveniently carried, we amused ourselves by swinging the net in different directions, catching a few dozen and then letting them fly again. Among the most numerous species were *Libellula basalis*, *L. trimaculata*, *L. exusta*, *Diplax intacta*, and *D. rubicundula*, with some others undetermined. During the drive there also floated past us on rapid wing several specimens of *Papilio cresphontes* and one or two *P. marcellus*, but they flew with the prevailing wind directly over the swamp, where pursuit was impracticable. As we passed a sunny spot in the woods, approaching the end of our journey, a small dark-coloured insect was seen hovering about some flowers growing by the road-side, which from its peculiar jerky flight, was evidently a *Thecla*. A brief chase resulted in its capture, when it proved to be *Thecla smilacis* Boisd., = *auburniana* Harris, never before, to our knowledge, recorded as occurring in Canada. As we approached the extremity of the Point, we left the swamps behind us and with them the multitudinous hosts of the larger Neuropterous insects, but several of the smaller species were present, associated with Dipterous insects, in prodigious numbers, flying in clouds from every tree and bush we touched, the vibration of their many wings causing a loud roar or buzz. The sides of houses and barns were so thickly covered with them as to almost hide the wood they rested on, but they did not venture inside the buildings.

The next day was unfavourable for collecting; the rain poured in torrents until early in the afternoon. As soon as it had ceased, we wandered several miles along the sandy roads and shores, and found many interesting plants and trees, but there were very few insects on the wing, excepting those belonging to the Neuroptera, which were everywhere in abundance. Late in the afternoon, while beating about among the bushes on the sand hills on the eastern shore, a yellow butterfly started up which at first was thought to be a pale *C. philodice*, but there was something unusual about its appearance and manner of flight which led us to pursue it until captured. Imagine our surprise when we found it to be a female specimen of *Terias Mexicana* Boisd.

In W. H. Edwards' Catalogue of Diurnal Lepidoptera, *Thecla smilacis* Boisd. is said to be found in the Atlantic States, Mississippi Valley and Texas, while the localities given for *Terias Mexicana* are Texas to Arizona; California, occasionally in Kansas and Nebraska.

Since both these butterflies are new to our Canadian lists, we append descriptions of them.

Thecla smilacis is thus described by Boisduval: "Upper side blackish brown, with a pale whitish spot near the middle of the costal edge; the secondaries have two thin tails as in the analagous species.

"Under side greenish, often washed with a little reddish, with a transverse whitish ray sinuous on the primaries, tortuous on the secondaries, bordered in front by a ferruginous tint. Between this ray and the base, the secondaries have another short transverse sinuous ray of the same colour. The extremity is marked by two or three ashy crescents, of which the intermediary is black in front, and the third in a line with two or three small ferruginous spots, more or less distinct. The anal palette is black, and near the fringe there is a small white marginal line.

"Larva, which feeds on *Smilax*, is green, with the head and feet blackish. It has four rows of red spots, of which the two dorsal are formed of smaller spots, and one on each side composed of spots somewhat larger.

"Chrysalis grayish-brown, with the abdomen more clear and reddish."

Harris, who regarded this species as distinct from *smilacis*, thus describes it under the name of *auburniana*, and Harris' description agrees more closely with the specimens captured by us than does that of Boisduval. Harris says: "The outermost of the tails of this insect is very short, and often nothing remains of it but a little tooth on the edge of the wing. It varies considerably in colour; the females are generally deep brown above, but sometimes the wings are rust-coloured or tawny in the middle, as they always are in the males; the oval opaque spot which characterizes the latter sex is ochre-yellow. Upon the under side the wings in both sexes are green, the anterior pair tinged with brown from the middle to the inner edge; externally next to the fringe they are all margined by a narrow wavy white line, bordered internally with brown; this line on the fore wings

does not reach the inner margin; on the hind wings it consists of six spots arranged in a zigzag manner, and the last spot next to the inner margin is remote from the rest; besides these there are on the same wings three more white spots bordered with brown between the zigzag band and the base; and between the same band and the margin three black spots, behind the middle one of which is a rust-red spot with a black centre. The wings expand from $1\frac{1}{20}$ to $1\frac{1}{10}$ inch. This pretty species is found on the mouse-ear (*Gnaphalium plantagineum*) in May, and on the flowers of the spearmint in August."

"*Terias Mexicana* Boisd. Boisd. Spec. Gén. 679. Figured on pl. 3, C. fig. 1, of Boisd. Spec. Gén.

"Wings brilliant citron yellow; primaries with a black border at the extremity, rather wide, ending squarely at the internal angle, showing near the middle a rather deep quadrangular sinus; the outer edge slightly sinuate, and whitish; secondaries, with the middle of the exterior edge prolonged to a prominent angle, in the form of a tail; a black border of moderate width, a little dentated on its internal side, not reaching the internal angle; costal edge washed with orange yellow, mingling with the ground colour.

"Under side of the primaries pale citron yellow, with a black central point, the edge intersected with brown points; the outer edge reddish near the fringe.

"Under side of secondaries yellow, sprinkled with ferruginous atoms, with a blackish central point; edge intersected with ferruginous points, and marked near the external angle with a spot of the same colour; the posterior half having four or five other spots of the same colour, of which two or three are in a line, and tending to form a transverse band; the middle of the outer edge more or less washed with ferruginous.

"Female differs from the male in the upper side being yellowish white, with a wider border, the quadrangular sinus more profound; the anterior edge of the secondaries widely orange yellow, and below, three ferruginous posterior spots form on the secondaries a narrow, transverse, ferruginous band.

"Texas—Louisiana—Mexico."

Among the other insects taken were *Papilio cresphontes*, *P. turnus*, *P. troilus*, *Colias philodice*, *Terias lisa*, *Argynnis cybele*, *Phyciodes tharos*, *Pyrameis huntera*, *P. atalanta*, *Anchyloxypha numitor*, *Pholisora catullus*, *Eudamus tityrus*, *Eudryas grata*, *Leucania unipuncta*, *Lucanus lentus* and *Macrodactylus subspinosus*. The latter species was very common on the flowers of the tulip tree (*Liriodendron tulipifera*), which was then blooming freely; also on the sour gum or Pepperidge tree (*Nyssa multiflora*).

The next morning we started early on our return journey and reached Essex Centre in time to take the afternoon train home. Had the weather been favourable we should doubtless have reaped a much richer harvest.

NOTES OF A JUNE RAMBLE.

BY W. HAGUE HARRINGTON, OTTAWA.

My office duties prevent me, unfortunately, from going afield during almost the entire month of July in each year, and perhaps a few notes on my last ramble, 29th June, may interest the inexperienced, and indicate some of the insects to be found at this time. The special aim of this ramble was to visit a grove of hickories, *Carya amara*, and investigate the insects occurring in these trees, but I desired also to obtain Coleoptera and Hymenoptera, especially sawflies.

My out-fit consisted of a flat beating-net constructed so as to be folded up snugly when not in use; a sweeping-net on a folding pocket-ring; a bottle containing coarse sawdust, with a morsel of cyanide for beetles; a wide-mouthed bottle lined with blotting paper, and having some cyanide in a cavity in the cork, for Hymenoptera and Diptera; a couple of boxes for larvæ, and last, but not least, a note-book and pencil. The day is favourable, the sun shining hotly, yet tempered by a slight breeze. My first capture is a half-grown Cimbex larva under an elm tree in the city, and in passing through the lumber yards I obtain *Buprestis consularis* and *Dicerca tenebrosa*. Along the river are seen many Neuroptera, including some fine species of Phryganidæ and Perlidæ. On the sides of a railway embankment (I am now in the Province of Quebec) grow a variety of young trees and other plants. The willows are first tried and yield very abundantly,

Diachus cutarius and *auratus*. Less numerous are *Monachus soponatus*, *Anomœa laticlavia*, *Agrilus torpidus?* and *A. fulgens*. I am pleased to capture a fine pair of *Saperda mutica*, as I have only hitherto taken them once. Among other beetles are *Trichalophus alternatus*, *Rhynchites cyanellus* and *Chrysomela multipunctata*, with larvæ of the same. On some trees a sawfly larva, yellow, hairy, with rows of black spots, is very abundant, and there are also larvæ of lepidoptera, including one of a Catocala. The raspberry bushes, which a few days ago were alive with bees and wasps, are now almost deserted, but the wilted tips of many of the young shoots show that some enemy has been at work. It is found that a foot or so below the top they have been neatly girdled by two rings about half an inch apart, and that between these rings has been inserted into the pith a long cylindrical egg, that of *Oberea bimaculata*. From a small balsam poplar is obtained *Saperda moesta*, and an examination discloses the larvæ of different sizes in gall-like swellings, about an inch or two apart, along the shoots which are not half an inch in diameter. Near the root, where the stem is somewhat stouter, is found a much larger borer, which is apparently that of some moth. The hickory grove is now reached, and the first tree yields a fine *Saperda discoidea*, a very rare beetle here. From other trees the following beetles are obtained: *Dorcaschema nigrum*, *Liopus alpha*, *Lepturges querci*, *Leptostylus macula*, *Hyperplatys asperus*, *Anthaxia viridicornis*, *Agrilus egenus*, *A. otiosus*, *A. bilineatus* and *Balaninus rectus*. Several tree-hoppers occur in various stages, including *Telamona unicolor* and *T. fasciata*. There are also some large flat half-grown bugs (yellow, with blackish markings,) one of which has killed a luna caterpillar about an inch long, and is sucking out its juices. The caterpillars of this moth are quite common, but generally smaller than the one mentioned, and a few larvæ of other moths are seen. Three specimens of the pretty little butterfly, *Thecla calanus*, are observed flitting about the trees, or settled upon the foliage. Space will not permit to mention the various galls, etc., which disfigure the leaves more or less. Scattered through the groves are a few oaks, some of which have the foliage noticeably disfigured by large globular woody galls placed upon the mid-rib of the leaf, which is much distorted and curled up. From these galls are just emerging small hymenopterous flies, with ample wings, of which I do not know the name. Some of the leaves are being devoured by brownish caterpillars, half an inch long, with a black head and a pair of black spines projected forward from one of the thoracic segments. They feed side by side in rows of five or six and eat the leaf from the tip downward. Upon these trees are found also the beetle *B. rectus*, which was upon the hickory, and which is remarkable for its extremely long and slender snout. Flying about through the grove are lovely butterflies, *Limenitis arthemis*, fresh evidently from chrysalis and almost persuading one to be a lepidopterist. Descending now into a meadow, through which flows a sluggish brook, I fold up the beating-net and screw the sweeping-net into its handle, which hitherto has been only used to tap the branches with. The stream is bordered with clumps of alders, willows, etc., between which grow luxuriantly ferns and many herbaceous plants, with sedges and various grasses. Magnificent fritillaries are hovering about the blossoms of the milkweed, which are just beginning to open, while numbers of *Neonympha Boisduvalli* flit about with a peculiar jerky flight. Beetles do not appear to be as common as they sometimes are here, but I take several specimens of *Scirtes orbiculatus*, three specimens of fireflies and several allied beetles, with several species belonging to the other families, as Coccinellidæ, etc. Three or four kinds of sawfly larvæ are found but none of the perfect insects are seen. Two, or perhaps three, species of Chrysops are unpleasantly numerous, but are not nearly so aggressive as I find them in a pine wood, through which I return. This wood rings with the shrill music of the cicada and is enlivened by many butterflies in the more open portions, where other trees and plants occur. My captures during the ramble are perhaps fifty species of beetles and a few Hymenoptera. This number is less than half of what I frequently obtain, but the value of collecting depends not so much upon the number of species taken, as upon the observations which are made upon the habits of the various species.

Swarming of Insects.

On the 3rd of June last I saw an immense collection of insects between the Chaudiere Falls and the Canada Pacific Railway bridge across the Ottawa. A long boom-log fixed

almost at right angles to the shore, formed with it a pocket into which were swept by the swift current chips, bark and other small drift-wood. The accumulation was literally swarming with insects which had evidently fallen, or been blown, into the river, and had sought safety upon the drift-wood floating with them. Having floated into a haven of refuge, they were crawling upon the more elevated places and drying themselves in the sun preparatory to flight. In many instances, however, they were doomed to disappointment, as sudden changes in the current and eddy would every now and then violently agitate the accumulation, wash off many of the insects, and send portions of the drift-wood again into the current to be carried further down. Beetles were most numerous, but there were also large numbers of Diptera and some Hymenoptera and Hemiptera. The Coleoptera were principally comprised of Chrysomelidæ, Coccinellidæ, Histeridæ, Nitidulidæ, Lampyridæ and Staphylinidæ, and were generally the smaller and commoner species.

THE PUNCTURED CLOVER-LEAF WEEVIL (*Phytonomus punctatus* Fab.)

BY A. H. KILMAN, RIDGEWAY, ONT.

A curculio new to Canada has appeared in this locality. Prevailing east winds about Aug. 10th wafted this new clover pest to our shores. This beetle, as far as I know, has not been mentioned in the *Entomologist*. It was introduced from Europe little more than three years ago. Appearing on the eastern seabord, and taking the continent in the inverse order to the movement of the Colorado Potato Beetle, it is working rapidly westward. Last year no specimens were reported west of Rochester, while in Eastern New York the clover crop was destroyed by this insect. On the date above-mentioned it appeared in Buffalo in such numbers that thousands were crushed on the pavements by the feet of passers-by. Simultaneous with this was its appearance in Ridgeway. I picked them from the fences and sidewalks, and found them in the grass on my lawn. Mr. Reinecke could have gathered them by the quart along the lake shore at Buffalo, where they had stranded after being carried by the wind far out upon the water. They have the extraordinary faculty of closing their tracheæ and suspending respiration while in the water, and an hour's sunshine on the sandy beach leaves them none the worse for a good soaking.

The beetle is two-fifths of an inch long, has a stout body of a dark brown colour ; sides of thorax and elytra dull yellow, a central yellow line on thorax, rows of black raised points along inner half of elytra with dashes of the same muddy yellow towards the rear. Each female has a "depositing power" of from 200 to 300 eggs. She punctures the clover stem and places an egg therein, or sometimes attaches it to the surface of the stem. The larva feeds upon the leaves, which it destroys rapidly, eating only during the night and hiding in the day time.

I am of the opinion that the advance guard of this insect invasion arrived last year and it is the main body now ; and further, that those now arriving will go into winter quarters and open up a lively campaign in the spring. I am led to these conclusions by the fact that many clover fields in this and adjoining counties failed this season to blossom fully, the Clover Midge getting the blame. Whatever the sequel may show, we fear that these invaders will prove of better staying qualities than those who crossed the border in '66, and turned to the right about at Ridgeway, because Canada was not the "clover patch" they were looking for.

THE ASH SAW-FLY (*Selandria Barda*, Say.)

BY HERBERT OSBORN, AMES, IOWA.

During the summer of 1882 a few of the ash trees on the college lawn here became infested with a Saw-fly worm which for a few days threatened to be quite serious. I made a few trials of London purple on the trees most seriously infested, but before I had gained results from many trees or had completed a study of the larvæ, they suddenly disappeared. So far as my experiments went they showed the London purple to be a successful remedy, and as applicable to these worms as to any of the Saw-fly group. No

adults were observed, and none of the larvæ I had under my observation matured ; so the matter necessarily came to a rest.

During the summer of 1883 the worms appeared in much greater numbers and distributed over many more trees. At the same time and upon the same trees with these worms I observed adult Saw-flies that I could have little doubt were the mature worms, although I did not succeed in finding the eggs and obtaining the larvæ from them, nor have I reared them as yet from the immature stage. Their presence in large numbers at the time when the newly hatched larvæ were appearing plentifully day after day, and the fact that the adult *must* be an insect of this particular kind, left little doubt as to their connection. During the present season I have observed these adults as early as April 15th, and the larvæ but little later, while the eggs from which the larvæ hatch were found deposited in the petiole of the leaf.

The adults are the *Selandria barda* of Say, the food plant of which, so far as I can find, has never been recorded.

No account of the larva or of its work is given in any of the works that I have been able to consult, and as it seems to me of too much importance to remain unnoticed, I venture to give what I know of its history with the practical results of my study, notwithstanding the doubts that rest over some parts of its life history. The pressure of other duties at the time these worms were at work prevented me from giving them the time they certainly deserved.

Life History.

The eggs are deposited in rows along the sides of the petiole just beneath the outer bark, and so neatly that it is almost impossibe to detect any break in the epidermis. Usually there are from six to ten on a leaf. They evidently increase much in size before hatching, pushing the bark up in a blister-like elevation, and if cut out of their covering are found to be very soft, the outer membrane exceedingly delicate and easily ruptured.

The larvae are evidently hatched within two or three days after the eggs are deposited, and are at first slender, whitish worms with black heads and thoracic legs. They crawl at once to the leaflets and appear to select the more tender ones for the commencement of their work. They grow quite rapidly and reach the first moult on the third or fourth day. Before moulting they are more whitish in colour, and the head particularly loses its ordinary colour. After the moult the head is jet black and glistens like a glass bead ; the six thoracic legs have also the same jet black colour ; otherwise the larva is clear green with a slightly darker dorsal line. There are seven pairs of pro-legs or false legs along

Fig. 5. - *Selandria barda* (Say). Leaf of ash showing position of eggs in petiole and work of larvæ.

the abdomen and one pair at the tail end. The body is not hairy, neither is it slimy as in some members of this genus, but the skin is somewhat wrinkled.

The worms are mostly found adhering to the under surface of the leaves, and forming a coil, though sometimes extended, especially when feeding, and as they eat away the entire leaf, cutting away at the edges or at the holes entirely through the leaf, they obtain any poisonous substance sprinkled or dusted on the upper surface.

When young they usually keep pretty well clustered together or on the same leaf, but later scatter quite generally, the early clustering being due no doubt to the eggs being laid near together and on the same leaf. The worms moult at least three or four times before reaching maturity.

The worms leave the trees before entering the chrysalis stage, and while I have not succeeded in tracing this stage, it is reasonably certain that it is passed under ground, or at least below the surface mould. It is quite certain also that the winter is passed in the chrysalis stage.

The imago has been observed abundant from April 15th till into the month of May, and also in the month of June. Whether these are two distinct broods or simply the result of great irregularity in appearance, I cannot say. It is certainly possible, however, considering the time that the first larvæ require to attain their growth that they may pupate and issue as a second brood in the month of June. These adults are black throughout, except the upper part of the thorax, which is honey yellow or sometimes orange or reddish, the amount as well as the shade differing somewhat in different individuals. The males are more slender and shorter than the females. In some specimens the front legs are partially yellowish.

They appear to be most active during the heat of the day, and can be caught without much difficulty in the hand during cool evenings.

PARASITES.

Tachina Flies. On trees where these worms were plenty I observed numerous specimens of the friendly Tachinas, and I also found their eggs on great numbers of the worms. So numerous were they indeed that I felt that the worms could safely be left to their attention.

Ichneumon Fly. A small *Ichneumon* occurred also in pretty good numbers, and though I obtained no direct evidence of their preying upon the worms, the habits of the Ichneumons are so well known that there can be little doubt of the meaning of their presence.

The Spined Soldier Bug (*Arma spinosa*) was observed with the Ash worms impaled on its beak, so it can be counted upon to assist in destroying them.

REMEDIES.

London Purple. The trials I made with this substance proved that it is deadly to these insects, and where it can be used without too great expense, it may be considered a certain remedy. On all small shade trees it can be applied as readily as to orchard trees, and even on trees of considerable height a good force pump will suffice to thoroughly sprinkle the leaves.

Hellebore is also very effective for these and other Saw-fly larvæ, but as it is no better than the preceding and much more expensive, there is no need of considering it here.

Arsenic may be used in solution like London Purple, but must be boiled to dissolve it.

THECLA NIPHON.

BY JAMES FLETCHER, OTTAWA, ONT.

About the middle of May, 1883, Mr. A. W. Hanham took a ♀ *T. Niphon* a few miles from the City of Ottawa. This was the only specimen at that time seen.

On the 4th May last, when walking along the Chelsea Road, near the village of Chelsea, P Q., with Mr. Harrington, he called my attention to a small butterfly which had just alighted on the bare road in front of us. This I was delighted to recognise as *Niphon*. Having no nets with us, a too near approach was only rewarded with the mortification of seeing the coveted prize flit lightly up to the top of some high pine trees. Subsequent to this date the weather was cold and wet for some time, and I had no opportunity to visit the locality until the 22nd of the month. On this date the Ottawa Field Naturalists' Club organized an excursion to the Chelsea Mountains for the purpose of entertaining the Fellows and Delegates of the Royal Society of Canada, and consequently we were honoured with the presence of our worthy President, Prof. Saunders, who happened to be in Ottawa attending the annual meeting of the Royal Society. As we passed the locality for *Niphon* on the way, the attention of all was directed to the pines as we passed. It was the President's experienced eye which detected the first examples; three beautiful tempting specimens were seen flying round the top of a white pine about 30 feet from the ground and well up out of reach; but none were obtained.

Two days later, however, Mr. Harrington, Mr. Ami and I went out again armed with a net attached to a long bamboo. Fortune favoured us at last. On the way out one female which had settled on the road was taken. When we reached the grove of white pines (*Pinus strobus*), where the three specimens had been seen two days earlier, Mr. Harrington climbed up to the top of the same tree and took two more, all in good condition. Bordering the pine grove was a field in which a great deal of the herbage was made up of *Antennaria plantaginifolia* in flower, and along the edge of this field, close to the trees, nine more were taken and two others seen. Highly elated at our success, we turned our steps homeward with twelve perfect specimens, eight ♀ and four ♂. Two days later I again re-visited the locality and met with a great disappointment. The day was intensely hot and butterflies were very plentiful. On arriving at the field I saw with delight *Niphon*, three or four at a time, in every direction, but my chagrin was great when on taking them one after another, I found there was hardly a presentable specimen amongst them. The locality is on the top of a hill, and for the past two days high and boisterous winds have prevailed, and this must have been the cause of their tattered state. Altogether, although a hundred could have been taken with ease, not a dozen were found worth collecting. Nevertheless, I boxed some females alive with the object of getting the eggs, and have succeeded in getting thirteen. Under the microscope they are objects of great beauty. The shape is round with a deep depression at the summit, almost half the depth of the egg. The general colour is pale green, and the surface is beautifully reticulated, the lines of the coarse netting being much raised above the surface and almost white. This gives the egg the appearance of having a white bloom on it. One egg laid on 26th May gave the larva to-day, June 5th.

The larva has already been described by Mr. Saunders, CAN. ENT., I., p. 95, and is also figured by Townend Glover in his plates of Lepidoptera, plate B., fig 8.

Among the specimens of the perfect insect I captured, I found there was considerable difference in the marking and beauty of the upper surface, particularly among the females. I imagine the typical colours of this sex to be a rich ruddy bronze, with a green sheen, and having a black border running round the margins of the wings. This border varied much in depth; it was sometimes almost restricted to the fringe of the wings, while in others it covered about one-fourth of the surface. These dark specimens are very handsome. There is also much difference in the size of the white bars in the fringe. The under side of both sexes is very similar and varies very little. The general colour of the ♂ is slaty black with, in some specimens, the green sheen seen on the females. A few specimens of the male had a reddish tint in the black, and a few examples had indistinct bronze eye marks where the tails are found in other species of this interesting genus. The flight of this insect is very quick and jerky, and when disturbed it often flies off to the tops of trees. When visiting the flowers of *Antennariæ* for honey, it has a curious habit of slowly moving its lower wings while closed alternately up and down. The tails found in other species are represented in this one by a curve in the margin by which the long fringe

gives the appearance of a little tuft of down when the wings are closed. I have about a dozen specimens to spare, which I shall be glad to give to any members of the Society who will send me a box for their transmission.

NOTES ON ANT LIONS.

BY J. ALSTON MOFFAT, HAMILTON, ONT.

One day on my late visit to Ridgeway a party of four went on an entomological excursion by boat to a place about four miles west, called Point Abino. After taking a survey of the situation and lightening our lunch-basket, we went to work. Each had his specialty; one desired beetles, another butterflies. Seeing *Myrmelion* on the wing, I turned my attention to the Ant Lions. I did not succeed in securing many of them, for although the funnel-shaped pits of the nymphs were in surprising numbers, very few of the mature insects were to be seen, it being probably a little too early for them. I captured but four specimens, one *obsoletus*, and three of what was kindly determined for me by Dr. Hagen, of Cambridge, Mass., as *Myrmelion abdominalis* Say, whose figured-gauze wings are charming objects seen through a lens. The slight acquaintance I have with them has been acquired during my visits to Ridgeway, none of them having ever been seen about Hamilton, so far as I know. Mr. J. Pettit secured an *obsoletus* while he was collecting at Grimsby, but I think he never got a second, although no doubt they were there to some extent, but probably very scarce. Fine loose sand is evidently a necessity of their existence in any locality, and I would suppose comparative seclusion; both of these they have in perfection at Point Abino. I saw large patches of sand so loose that weeds could not take root upon it, and which had not been disturbed by the foot of man or beast probably for weeks, and some of these places were so occupied with their pits that it did not seem possible to get another one in without interfering with those already there. These pits were about three inches across the top, and two or two and a half deep. Their width must be in exact proportion to their depth, for the slope of the sides is just what will support the particles of loose sand. They must have their pits to make frequently during their larval existence, for every heavy shower will fill them all up. They never expose themselves to view except by accident, but lie just immediately under the surface. The larva is provided with an apparatus for throwing up the sand, which it can do with sufficient force to scatter it for four or five inches around, and with the rapidity at times of the tick of a watch, working itself downwards as it throws off that above it, the sand flowing in as it deepens, which it jerks up again, the most of which falls outside the range of the pit; and so continues the operation until the required dimensions are obtained, when it lies perfectly still at the bottom and awaits events. An industrious ant out on a foraging expedition, in the hurry of its eager search runs over the edge of the pit. The lion at the bottom seems to be instantly aware of the fact, and begins throwing up jets of sand with great rapidity, which come showering down, frightening the ant, and it makes frantic efforts to get out; but the more vigorously it scrambles for the top, the more rapidly it slides to the bottom, where it is at once seized. The struggle ensuing dislodges the loose sand, and a miniature avalanche pours down from all sides, which materially assists the lion to secure its victim, and the ant is soon taken out of sight. I am not aware that it has any means of enticing its prey, and as its does not go searching for it, but is entirely dependent on what happens to come in its way, I suspect it must have many a long wait between meals.

The mature insect is neither a rapid nor a graceful flier, but flaps its wings in a heavy, clumsy manner, quite different from what one would expect in so exquisitely delicate a creature. It prefers to alight in an upright position, and rests with its wings folded close to its sides.

I take pleasure in announcing the discovery of a moth which is an important addition to the Canadian list. When on a visit recently to my friend, Mr. Kilman, of Ridgeway, in the County of Welland, whilst looking over his Lepidoptera, my attention was arrested

by the unusual appearance of some specimens labelled *Callosamia promethea*. As I was pondering and puzzling over them, it began to dawn upon me that it was not *promethea* I was looking at, but *angulifera*, and upon enquiring, he informed me they were his own captures in that locality.

A few years ago I was put in possession of two pairs of *angulifera* through the kindness of Mr. James Angus, of New York, the first I had seen of them. You are aware how marked the difference is between the males of the two species, the male *angulifera* bearing a strong resemblance in both form and colour to the female *promethea*, with the addition of the heavy whitish angular mark in the centre of the wings, from which I presume it obtained its name. Mr. Kilman had three specimens, two males and a female. He gave me a male, and on comparing it with the N. Y. specimens, I find it two sizes larger, and with less yellow in the general colouring. The locality where Mr. Kilman resides is particularly favourable for entomological pursuits—sandy hills and gravelly ridges, with their appropriate vegetation—marshy flats full of flowering shrubs and weeds —virgin forests with an abundance of decayed and decaying timber—belts of young second growth trees—swampy and dry ground, and long cultivated fields with their diversity of vegetable productions, all in close proximity to Lake Erie shore, whilst any and all of them are within a few minutes' walk, making an exceedingly attractive and productive hunting-ground for the collector.

RARE MOTHS AT MONTREAL.

BY G. J. BOWLES, MONTREAL, QUE.

Last fall an important addition was made to our list of Sphingidæ. A number of larvæ of *Philampelus achemon* were discovered on cultivated grape-vines growing in the open air, at a gentleman's residence in this city. Another western Sphinx, *Deilephila lineata*, is taken here, but very rarely. I have heard of only two specimens in ten years. Last year, a specimen of *Samia columbia* was brought to me, captured in a central part of the city. A few days afterwards I received a *Hepialus thule*, Strecker, described by him in No. 12 of his "Lepidoptera," from a specimen sent him from here by Mr. Caulfield. Mr. J. G. Jack, of Chateauguay Basin, also has a very beautiful specimen of this moth. These three are, I believe, the only specimens in collections.

NOTES ON THE ENTOMOLOGY OF VANCOUVER ISLAND.

BY GEO. W. TAYLOR, VICTORIA, B. C.

Since I came to this island, a couple of seasons ago, I have made a practice of capturing any insects that came in my way, and I have sometimes made an expedition purposely in pursuit of such prey. The result is an accumulation of about one thousand species of all orders, which probably represents not more than five per cent. of our insect population.

As my favourite studies are in another department of Zoology, I have neither the inclination nor sufficient knowledge to work out all this material myself, but with the help of entomological friends, resident, alas! sadly too far off, I am gradually making progress with the naming of my captures, and I propose, with your permission, to publish from time to time in the *Canadian Entomologist*, lists, with notes, of the species that have occurred to me. I hope that this will be both useful and interesting to Eastern entomologists, as I notice that hardly more than one-half of the insects I have already identified are named in the recently published check list of Messrs. Brodie & White, and many of them will prove, I think, new to science.

This month, however, I will content myself with a few general and preliminary remarks. Our climate (I am speaking only of the south-easterly portion of Vancouver Island) is supposed to resemble that of the south of England, but I should call it decidedly milder. Our spring is warm and early, and the summer hot and dry, but with cool nights and copious dews. On the other hand, the winter is mild, and for about three months exceedingly wet. All kinds of vegetation are very luxuriant. The uncultivated lands are thickly covered with heavy timber, and the cultivated lands are at present few and far between, which makes it easier to combat the attacks of our noxious insects (and of these we have not a few). All our climatic conditions, except perhaps the wet winter, are favourable to abundant insect life, and this undoubtedly exists here. There are several points about our insect fauna that cannot fail to strike an observer. In the first place the extreme abundance of Diurnal Lepidoptera must attract attention. Nearly forty species may be marked *abundant*. A patch of blossom in May, covered with *Blues* and *Frittillaries*, with an occasional *Colias* and two or three magnificent species of *Papilio*, is a sight such as an English entomologist, at least, never sees at home, and later in the year the hundreds of *Vanessa*, *Chrysophanus*, *Pamphila* and *Limenitis* make a very different but not less beautiful picture.

The Orthoptera, too, intrude themselves upon our notice. Grasshoppers in thousands exist in some localities, and do considerable mischief, and large and gorgeous species, with red or yellow under wings, astonish the uninitiated by their sudden appearance or equally sudden vanishing. Two kinds of Cricket fill the air with music in early summer, and a couple of species of *Cicada* lend them most efficient aid. Of Hemiptera, Neuroptera and Diptera, I have not collected many, perhaps only 200 species in all, but they include some remarkably fine kinds. Among the Coleoptera I am struck with the abundance of *Adephaga*, many of them, too, being of large size. The genera *Calosoma* (e. g. *tepidum* Lec.), *Cychrus* (*marginatus* Dej. and *angusticollis* Fischer), *Carabus* (*tædatus* Fabr.), *Omus* (*Dejeani* Reiche and *Audouini* Reiche), *Holciophorus Promecognathus*, &c., being represented by very fine species. The Longicornes, too, are abundant, and most of them are absent from Brodie & White's list. The Elateridæ and Buprestidæ are also numerous; in fact all wood-feeding insects seem to abound, as do carrion feeders, while on the other hand, Lamellicornes are very scarce.

Our Hymenoptera are fine and interesting; the *Vespas* are in fact decidedly *too* fine. *V. maculata* Fab., *V. media* Oliv., and a supposed new species, being remarkably plentiful and pugnacious. Less plentiful, but no less conspicuous and interesting, are the Uroceridæ, my first five specimens proving to belong to as many different species.

Nearly one hundred species of Hymenoptera (about half my collection) have been identified for me through Mr. Brodie, of Toronto, and they are consequently most of them included in his check list. These shall form the subject of my next communication, and in concluding for the present, I may mention that my duplicates and the loan of my type specimens in any particular family or order will be accorded with very great pleasure to any specialist who will favour me with a request for the same.

SPINNING CATERPILLARS.

BY FREDERICK CLARKSON, NEW YORK CITY.

Milton, when he wrote of Nature's bounty, and referred to the

> . . . . "Millions of spinning worms
> That in their green shops weave the smooth-hair'd silk."

had thoughts no doubt of the obedience due from Nature's subjects to Nature's King. A work ordered and a work performed. Were men as loyal to their King, what a garment of righteousness would each man weave wherein to appear amid the flood-light at the Court on high! The caterpillar, at the sighing of the autumnal wind, enfolds itself in its

silken shroud preparatory to a winged flight, leaving to the world the record of a life well spent—an unbroken thread of duty done: a treasury of silk to deck the sons of men

"In courts, in feasts, and high solemnities."

To grace man's outer life, and if in proper mood and contemplation, his inner life as well; for Nature's lessons are not learned under their external forms, but under the spiritual beauty and verities they represent.

"That not a natural flower can grow on earth
Without a flower upon the spiritual side,
Substantial, archetypal, all aglow
With blossoming causes—not so far away
That we, whose spirit-sense is somewhat cleared,
May not catch something of the bloom and breath."

Nature has many voices. She speaks to us in joyful song amid the activities of the day, and in saddening dirges during the still hours of the night, while throughout her wide domain, in song of life and dirge of death, she whispers Resurrection.

Among the multifarious forms of insect-architecture, all of which are of absorbing interest, I purpose at this time to record a few notes relating to the cocoons of the Bombycidæ. The cocoon made by the Worm of the Orient has, from the circumstance that its silk is so extensively used in manufacture, been fully described. This paper concerns those of the Polyphemus, Cecropia, Cynthia, Luna and Promethea caterpillars, and it may be regarded as an endeavour to foster an organized system of silk culture with these worms, the Cynthia worm especially favouring cultivation, as it is double-brooded, and since its introduction from the East, together with its food plant, the Ailanthus, it has become largely distributed throughout the country. The habitat of some of these species is co-extensive with the Union, and silk culturers are alike advantaged in every section of the country with an abundance of food plant in our native trees. The silk produced by them, though not of as fine a texture as that spun by the Mori Worm, is yet abundant and of much greater strength. Notwithstanding the fact that the pointed end of the cocoons of the Cecropia, Cynthia and Promethea worms is left open for the exit of the moth, the threads are unbroken and the cocoons can be unwound. The Mori Worm covers the interior lining of the cocoon with a gummy secretion, and when the moth escapes, the threads, if not broken, are thought to be in such danger that cultivators of silk destroy the pupa before the period of emergence. There are entomologists, however, who deny that the threads are broken at all, for they admit having succeeded in unwinding cocoons from which the moths have escaped. The Cecropia, Cynthia, and Promethea worms line each layer of silk, as well as the interior of the cocoon, with a gummy secretion, leaving the silk at the exit opening free of agglutinating properties. This allows of a ready escape of the imago without danger to the thread. If the cocoons of these worms be divided lengthwise, and immersed in boiling water for a few seconds, a careful manipulation will permit the separation of the several layers of silk, when, by the aid of a lens, the life work of the caterpillar is beautifully presented and the continuity of the thread can be discoverod. The exterior section of the cocoons of the Cecropia and Cynthia worms can be easily divided into three layers of silk, while the interior portion is divisible into six. The Luna and Polyphemus worms construct cocoons somewhat similar to the Mori Worm, and as all parts of the interior lining are sealed, it becomes prudent, perhaps necessary, to destroy the pupa.

The Hairy Larvæ and their Parasites.

It is generally acknowledged by Entomologists that the hairy larvæ, such as the Arctians and their allies, very commonly escape parasitic attack, a circumstance attributable to the fact, that in order to permit the deposit of ova, these caterpillars must be discovered by the parasites in favourable postures, or else worried by them into such, that the spines separating, give the only opportunity for the insertion of the ovipositor. This was clearly demonstrated in an attack made by an Ichneumon upon a larva of *Apatela Americana* Harris, which came under my observation in the early part of last autumn.

This genus belongs to the family of the Noctuidæ, the larvæ of which, like the Arctians, are clothed with dense spinular hairs. The caterpillar had secured itself by its abdominal legs to the midrib of a maple leaf, having the fore part of its body elevated, similar to the attitude common to the larvæ of the Sphingidæ. The parasite displayed great energy in the effort to deposit, seemingly as if to compel the caterpillar to change its postion, but as the caterpillar remained immovable for many minutes, probably a quarter of an hour, I was led to the conclusion that it realized its security in the position it had taken. After driving the parasite away, I discovered that the caterpillar, though perfectly life-like in form, was dead, and as hard as if petrified, and that the parasite, guided, as it would appear in this case, solely by sight, had been, like the Entomologist thoroughly deceived. In view of the commonly accepted opinion, that insects are attracted by odour, not only to their own food, but to the proper food for their progeny, whether it be animal or vegetable, I have referred to this incident, as contributing to the theory that the parasite, in providing food for its progeny, seeks it by sight; for it would seem most improbable that a dead and dried caterpillar should retain a sufficiency of its natural odour to attract. The incident also illustrates, by the mode of attack and the prolonged effort at ovi position, that the caterpillar must be brought into an attitude favourable for the reception of the egg. I am inclined to the opinion that the reduction of these moths through the instrumentality of parasites, is largely effected while in the pupa condition, having noted this peculiarity of habit during our recent extraordinary visitation of the *O. leucostigma* Smith. The full-grown larvæ of this species, collected by me, developed into moths, while from cocoons gathered it was not uncommon to obtain parasites. The cocoons of the hairy larvæ commonly consist of loose interwoven hairs, and are not so dense but that the pupa is readily discoverable by the parasite, even if the cocoons themselves do not attract them.

The Dung Pellet Makers.

The term Scarabaeus, as applied by the ancients to the Sacred Beetle of Egypt, and afterwards by Linnaeus as comprehending the great division of the Lamellicornes of Latreille, is derived from Khepra, an African word, which means cipher or circle, and has reference to the orbicular shape of the pellet of dung that contains the deposit of ova. Khepr is no doubt the root word, and is analogous with the Greek word Kapolos, the Latin word Scarabæus, and the English word Crab. Any ordinary scholar can follow the slight linguistic change that produces one from the other. The Scarabæus is imaged amongst the hieroglyphics of the Egyptians, and was regarded by those ancient people as a symbol of the world and the sun. It is not improbable that the term Scarabæus is associated in the minds of the many with the idea of a Crab, not only because the Sacred Beetle of Egypt is represented under that form, as a sign in the zodiac, but also from the peculiar conformation of the clypeus and thorax of the beetle to the shell-case of that Crustacean. Scarabæus evidently means a ball. It seems to the writer that we apply this term to cover a larger class of beetles than the signification of the word will admit. This article, however, is not intended to suggest any limitation in the classification, but merely to ascribe to these indefatigable labourers the designation which they have earned in the very infancy of human observation.

The Elm Leaf Beetle (*Galeruca Xanthomelæna*, Schrank.)

I visited Flushing, L. I., July 8th, to examine the insect reported to be infesting the noble old English elms which adorn the principal streets of that village. Three weeks ago these trees were in luxuriant foliage; they have now the appearance as if they had been scorched by fire. I discovered them to be attacked with a countless host of the larvæ of this beetle. The American elm and other indigenous trees have thus far escaped, but it is not improbable, as this beetle is double brooded, that the numerous larvæ will from the force of circumstance attack them. The eggs are laid in clusters along the veins of the leaves, on their under sides. The larvæ, as soon as hatched out, begin to devour the leaves, which they render lace-like, and when full fed they do not undergo transformation by fastening themselves to the surface of the leaves, as is the habit with other species, and

as I have seen recorded of this, but transform within the crevices of the bark. At this time, July 8th, the trunks of the trees are covered with the larvæ seeking places to transform, and there is scarcely a crevice of the bark but what is filled with the yellow pupal forms which will in a few days disclose the imagines. The ground immediately surrounding the base of the trees is covered with the pupæ, which have been dislodged from their positions in the bark by the eager efforts of larvæ crowding in the crevices to undergo transformation. As this change occurs within the crevices of the bark of trunk and limb, it becomes impossible, unless at great labour, to apply means for exterminating the pest. The evil, however, is likely to cure itself, for the larvæ are so numerous, and such insatiate feeders, that starvation will probably end the visitation. Much good, however, can be done by brushing down the trunks of the trees, sweeping the ground immediately beneath, and destroying the entire mass by fire.

A PARASITE ATTACKING THE ZEBRA CATERPILLAR (*Mamestra picta*, HARRIS).

BY F. B. CAULDFIELD, MONTREAL.

On July 19th, 1881, a caterpillar of this moth was found on a cauliflower which had been brought from market, and was placed in a tumbler with some of the leaves. By the 21st it had shrunk considerably in size, and was greatly changed in appearance, the black and yellow markings that make this larva so conspicuous an object having faded to a dull whitish colour. On the 22nd it was lying on the bottom of the glass and was revolving continuously. Under natural conditions it would, I believe, have entered the earth to go through its transformations, and the curious revolving motion might perhaps have been for the purpose of forming and smoothing its cell. On looking at it on the morning of the 23rd, a soft white flattened ichneumon larva had issued from it, and had commenced the construction of its cocoon by spinning a few white threads. By evening it had surrounded itself with a thin egg-shaped cocoon of a yellowish white colour, through which the movements of the enclosed grub could be seen. On the morning of the 24th the cocoon was finished and was dense and firm. It was of a reddish-brown colour in the middle, blackish-brown at each end. The perfect insect emerged on September 13th, 1881, and proved to be *Ophion purgatus* Say. *Mamestra picta* is a well-known insect, and is treated of by Harris, Riley, Lintner and others, but I do not remember seeing any account of its being attacked by a parasite.

ENTOMOLOGICAL NOTES.

BY A. W. HANHAM, PARIS, ONT.

I have to record the capture of some Coleoptera in rather an unusual manner. Last week while out in the woods on one of my collecting tramps, I was attracted to an old stump by the glittering of something in the sun. Closer acquaintance did not at first solve the mystery ; the bright object seemed to be buried among some debris. Further examination revealed the dried and withered remains of a small toad, the glitter being that of some Buprestidæ partly exposed in what was once the stomach of the defunct batrachian.

I carried the remains home, and with no little trouble excavated in a perfect state the following :—

Calosoma frigidum Lec.

Platynus placidus Say. Several.

Dicerca } A pair.

A small weevil unknown to me.

Portions of *Cicindela repanda* Dej., other Coleoptera and some Diptera.

From the above list it would seem that toads can hardly be called useful, seeing that such a large proportion of their food—if we take this one for a standard—consists of decidedly beneficial insects. I will allow that they are very desirable tenants for the owners of gardens, but in the woods they must be formidable rivals to the entomologist. This year they have been unusually abundant, and the rarity of many of our beetles is no doubt caused by their rapacious appetites.

I have not taken *C. frigidum* before ; the *Dicerca* is also new to me. I find it very difficult to determine my captures, and a serious obstacle to taking satisfactory notes. I am indebted to W. H. Harrington, of Ottawa, for the naming of a considerable number last winter. *C. calidum* Fabr. also seems to be quite rare here ; I made special search for it this spring and found but one specimen. I took another on October 27th last year, from the heart of a decaying log. Is it double brooded in this part of Ontario? Or would it be possible for one attaining the perfect state in June to live through the summer and survive the winter? The specimen I captured in October had evidently prepared to hybernate. On June 15th I found under stones on dry ground a pair of *Calosomas* which are entirely new to me. I expect though I could name them from the Society's collection in London.

I should have been surprised to find so large and active a beetle as *C. frigidum* falling a prey even to the biggest of toads. The Buprestidæ must also be rather tough morsels for them to digest. It will ever remain an open question as to whether "our departed friend" lost its life through its own greediness, or met a violent death at the hands of one of its many foes. I have read of some ardent collectors who secured many rare beetles by capturing and killing the toads they found in their rambles.

ON PRESERVING INSECTS.

BY PH. FISCHER, BUFFALO, N.Y.

I have often read articles about keeping parasites out of cabinets, and have seen in many entomological papers different remedies suggested to keep them from destroying, in a very short time, even the largest collection. I will now add my own experience, and remedy which always proved to be efficient during my fourteen years' collecting, in which time I have not even lost one specimen. It will especially prove of interest to the beginner. In the first place I would advise all those who cannot afford a large cabinet with good fitting drawers, to go to any good joiner and have some boxes made after the following pattern : Take the lumber about three-sixteenth inch thick for top and bottom, for the sides a quarter of an inch. Have the box about fifteen inches long by twelve inches wide, and four inches thick outside measure, and shape it book form, the bottom and top a quarter of an inch projecting. That portion which represents the cover of the book is cut into lengthwise, so as to make two receptacles, each about two inches high. The back is made of three-quarter inch lumber, in the shape of the back of a real book, which is covered with some strong cloth or thin leather outside, and cloth inside, to act as hinges. The two parts will have to be constructed so that they will, by closing them, fold together about a quarter of an inch. Have this neatly covered and lined with a suitable soft material, and it will be a tight and handy box for any kind of insects. Before transferring insects in a new box, I put them on cork and expose them to a moderately hot oven, which I also invariably do with insects received through exchanges. After a certain time, say half an hour, I take them out, and they are placed in the box, in which is pinned a little sponge the size of a small nut, saturated with carbolic acid (crystallized), which has to be renewed every six or eight weeks. Old cabinets infested

with parasites, when once introduced, can be cleared by the same method, only that the drawer or box, before pinning back the specimens, also has to be exposed to the heat of the oven.

AN INSECT-EATING BIRD.

BY W. W. HILL, ALBANY, N. Y.

Some two or three years ago I reared from the egg several hundred caterpillars of the Promethea moth. They were feeding finely upon the common lilac (*Syringa vulgaris*), the leaves of which they ate readily. The third moult had been reached and they had attained to an inch or more in length, and there seemed every prospect of their reaching maturity, when in an evil hour an oriole discovered their whereabouts. The bird was soon joined by a companion, and the pair proceeded to kill and eat with the greatest possible avidity. Discovered in their work by persons in the house, they were several times driven off, but quickly returned with increased zest to the work of destruction. On my arrival an hour later there remained but a few of the smallest specimens, which had either been overlooked or left to grow fatter.

STRANGE MOVEMENT OF CATERPILLARS.

BY EUGENE L. KEEN, PHILADELPHIA, PA.

While walking along the New Jersey shore of the Delaware River, near the village of Delanes, last July, I was startled by hearing some small bodies falling through the foliage of an oak tree, and as they struck the leaves it sounded as if it were raining, but as the sky was perfectly clear, my curiosity was aroused. I turned around to see what the noise was, and saw some black larvæ falling to the ground, and further investigations showed that quite a number of these larvæ had fallen to the ground from the tree, and here and there I saw several Tachina flies, I believe a species of Exorista, hovering around the larvæ trying to deposit their eggs. From this I suppose that these Tachina flies had flown to the tree in search of victims, and most probably the larvæ had dropped from the tree to escape their enemies. Perhaps many larvæ take this method of trying to escape from their Hymenopterous and Dipterous parasites.

THE CROTON BUG IN QUEBEC PROVINCE.

BY REV. THOMAS W. FYLES, SOUTH QUEBEC.

One morning last November I went to the Chaudiere Curve, to meet the train from Halifax, which had been delayed for some hours. I found two men in the waiting-room who had spent the night there. They complained that swarms of black beetles had troubled them all night so that they could not sleep. Upon my questioning the correctness of the statement, they said, "Well, here they are in all the cracks," and they forthwith commenced to poke the creatures out. The insects were numerous enough, but they were not beetles, nor were they black. They were specimens of the German Cockroach, *Ectobia Germanica*. I afterwards enquired of one of the railway employes as to the time of the first appearance of the insects. The man told me that he first noticed them in 1882. I asked if they had appeared anywhere else in the neighbourhood. "Yes," he answered, "in my own house last winter; "but," he added, "I am not there in the day time, so I left the windows open and froze them out."

The enquiry is interesting, How did *Ectobia Germanica* get to the Chaudiere? At that place, which is nine miles from Point Levi, luggage is transferred from the Grand Trunk to the Intercolonial, and *vice versa*; and the creatures might have been brought by American tourists from Boston (where it abounds), or by immigrants from Germany, or other parts of Europe. The latter supposition is the more likely, inasmuch as the immigrants far exceed the tourists in number, and also are of a different class—a class less likely to be careful as to their properties and equipments. No doubt the "bug" was carried to Boston by immigrants. It is not a "Yankee invention."

ON CERTAIN FAMILIES OF THE NEUROPTERA, IN THEIR RELATION TO THE FISHING INTERESTS.

BY THE REV. THOMAS W. FYLES, OF SOUTH QUEBEC.

In this land of lakes and streams the inland fisheries ought to be of great importance, and whatever has a bearing upon them is deserving of attention. It is well-known to anglers and to naturalists, that many species of the Neuroptera, or nerve-winged insects, in their different stages of existence form a very large proportion of the food of fresh water fishes.

Latreille classified the Neuroptera as follows:—

Subulicornes:

Libellula
Æshna
Agrion
Ephemera

Planipennes:

Panorpa
Nemoptera
Bittacus
Boreus
Myrmeleon
Ascalaphus
Hemerobius
Asmylus
Numphes

Planipennes—Continued.

Semblis
Corydalis
Chauliodes
Sialus
Rephidia
Hemerobius
Psocus
Perla
Neumora

Plicipennes:

Phryganea
Sericostoma
Mystacida
Hydroptila.

Of these families, Ephemera, Perla, Corydalis and Phryganea, especially have been long known as affording "killing" baits for the different species of fish.

These fathers of the gentle craft—Walton and Cotton, make frequent mention of the *Green Drake* and *Grey Drake* (Ephemera); the *Stone Fly* (Perla); the *Camlet Fly* (Phryganea), and the *Caddis* (the case-worm or larva of the Phryganea).

Walton speaking of the trout says:—"He especially loves the May Fly which is bred of the cod-worm or cadis, and these make the trout bold and lusty, and he is usually fatter and better meat at the end of that month (May) than at any time of the year.—*Comp. Ang. Ch. IV.*

He enumerates "divers kinds of caddis or case-worms," and he sums up with, "I will tell you, scholar, several counties have several kinds of cadises, that indeed differ as much as dogs do, that is to say, as much as a very cur and a greyhound do. These be usually bred in the very little rills or ditches that run into bigger rivers; and I think a more proper bait for those very rivers than any other. I know not how or of what this caddis receives life, or what coloured fly it turns to, but doubtless they are the death of many trouts."—*Ib. Ch. VII.*

Cotton, the disciple of Walton, surpassed his "father" in the angler's art, in fly-fishing at least. Speaking of natural flies, he says:—"We generally use but two sorts, and those but in the two months of May and June only, namely, the green drake and the stone fly; though I have made use of a third that way called the camlet fly, with very good success for grayling, but never saw it angled with by any other, after this manner, my master only excepted, who died many years ago, and was one of the best anglers that ever I knew.—*Comp. Anglers, Pt. II., Ch. V.*

In Ch. VII., under the head of "May," he tells us that "we have four several flies which contend for the title of the May-fly, namely:

The Green Drake,	The Black-fly,
The Stone-fly,	The little yellow May-fly,

And all these have their champions and advocates to dispute and plead their priority; though I do not understand why the two last named should, the first two having so manifestly the advantage both in their beauty and the wonderful execution they do in their season."

Under "December," he says: "Of all these (and I have named you a great many killing flies) none are fit to be compared with the *Drake* and the *Stone-fly*."

Of the insects, then, belonging to the Neuroptera, of which I shall now speak, these shall take precedence,—*Green Drake*, *Grey Drake* (Ephemera).

It is to Aristotle that we owe the name *Ephemeron*, or Day fly, as applied to the insect known to anglers as the *Drake*. The Old Greek naturalist tells how the River Hypanis brings down, at a certain season, capsules like grape-seeds, out of which, when they burst, proceed living creatures which fly about till evening, and then die.—*Hist. of Animals, Bk. V., ch.* 18.

The female lays her eggs (to the number of seven or eight hundred) in batches, here and there, on the river. They sink to the bottom and become attached to submerged objects. Here they soon hatch. The young larvæ tunnel for themselves tubular retreats in the mud of the river, and feed upon minute objects both vegetable and animal. They have a remarkable breathing arrangement on either side of the abdomen consisting of a row of fringed tracheal appendages, or gills, which are constantly agitated, to bring fresh currents of oxygenated water within reach of their respiratory action.

The nympha resembles the larva, but has the addition of wing cases in which the embryo wings lie folded. When the hour arrives for the great change from its aquatic to its ærial existence, the insect rises to the surface of the water, or ascends some object that affords vantage-ground—a post, or flag, for instance. It then rends its nymphal case, its diver's habit, and lo! the pseud-imago or *Green Drake* is presented to our view. We say the pseud-imago, for, as the rider in the circus throws off dress after dress until harlequin is revealed, so Ephemera has yet to cast aside another casing ere it can appear in full activity as the *Grey Drake*. Not only the nymphal case, but the cast-off filmy dress of the pseud-imago of Ephemera, may often be found in early summer in the insect's favourite haunts.

In its perfect form the Drake is a four-winged fly; its hind wings being very small. It carries all its wings erect. Its antennæ are short and awl-shaped (*Subulicornes*). It has no mandibles—as the fly eats nothing, it has no need of these. Its tail is furnished with setaceous filaments. Over what period the existence of the insect extends has not been accurately determined. It is supposed that its aquatic life endures till the third year; its after existence is very brief—the Green Drake stage lasts for two or three hours; the Grey Drake for not many more; for as soon as the female has laid her eggs she perishes. With regard to the *name*, Cotton says, the insect is called *The Drake*, because its tail is turned back, but the generally received opinion is that it is so named because the artificial representations of it are made from the feathers of the Mallard, or Wild Drake.

We are told by Réaumur, that, in France, the flights of Ephemeræ sometimes resemble a fall of snow when the flakes are largest. And I have often sailed on the Ottawa and the St. Lawrence when the vessel has been covered to an offensive degree

with Ephemeræ and Phryganeæ. Dr. H. A. Hagen has quoted from a letter to the late Professor Agassiz, from Mr. George E. Woodwell, of the *Tribune* Office, Chicago, Ill., July 23, 186 (?) as follows:—

"I send you a number of specimens* of a fly which annually visits our lake-cities, and which has the present summer appeared in larger swarms than ever known before. During the recent hot nights they have poured in from the lakes in myriads, rendering it necessary in lighted buildings to close the windows and doors in order to escape their visitation. For several nights past they have thus swarmed upon us, and the morning would witness about the posts of the street lamps large heaps, in some instances three inches deep, and covering an area of two or three yards square."

Such times are the grand festivals of the finny tribes, when they become fat and well liking.

The Stone Fly (*Perla*).

Cotton's quaint description of this insect is as follows:—

"Having told you the time of the *Stone-fly's* coming in (from the middle of April to the end almost of July,) and that he is bred of a cadis in the very river where he is taken, I am next to tell you that this same *Stone-fly* has not the patience to continue in his crust or husk† till his wings be full grown, but so soon as ever they begin to put out. that he feels himself strong (at which times we call him a jack,) squeezes himself out of prison, and crawls to the top of some stone, where if he can find a chink that will receive him, or can creep betwixt two stones, the one lying hollow upon the other, which, by the way, we also lay so purposely to find them. He there lurks till his wings be full grown, and there is your only place to find him, and from thence doubtless he derives his name; though, for want of such convenience, he will make shift with the hollow of a bank, or any other place where the wind cannot come to fetch him off. His body is long and pretty thick, and as broad at the tail almost as in the middle; his colour, a very fine brown, ribbed with yellow, and much yellower on the belly than the back; he has two or three whisks also at the tag of his tail, and two little horns upon his head. His wings, when full grown, are double, and flat down his back, of the same colour, but rather darker than his body and longer than it, though he makes but little use of them; for you shall rarely see him flying, though often swimming and paddling with several feet he has under his belly, upon the water, without stirring a wing." Comp. Ang., Part II., ch. 8.

In England four insects at least belonging to the Perlina bear the name of "Stone-fly." Their specific names are *Marginata*, *Grandis*, *Cephalotes*, and *Bicaudata*.

The female Stone-fly has the habit of carrying her bundle of eggs about with her between the candal setæ (which Cotton calls "the whisks at the tag of her tail"), and this for some time before depositing it in the water. The mass is as large as a swan-shot, and black. Seen under the microscope the individual eggs resemble dark brown oval capsules, with projecting fibres at one end denoting the point of egress for the larva.

Mr. P. H. Gosse, in his *Canadian Naturalist*, speaks of the Perlina as "Water-flies," and alludes to them, under different dates, from the beginning of April to the middle of of July.

Hellgrammite (*larva*). Horned Corydalis (*imago*). (*Corydalis cornutus.*)

Corydalis cornutus is the monarch of the Water-flies. I well remember the admiration with which I first looked upon the weird beauty of this remarkable insect, Fig. 6, represents the female with the wings expanded; Fig. 7, *c*, the male with the wings closed. The undulating body, dark and glabrous; the plated thorax, the square head, the powerful mandibulæ; the projecting eyes, black and bead-like; the long setaceous antennæ; the wonderful wings, smoked yet transparent, flecked with white, nerved and

* The letter contained dry specimens of *Ephemera natata*.

† Observe that Cotton is here confusing the larva of the Stone-fly with that of Phryganea, to be presently described.

barred, and measuring five inches from tip to tip—presented, *tout ensemble*, an appearance both grim and fascinating. Beholding it one could not but desire to know more of the creature's history.

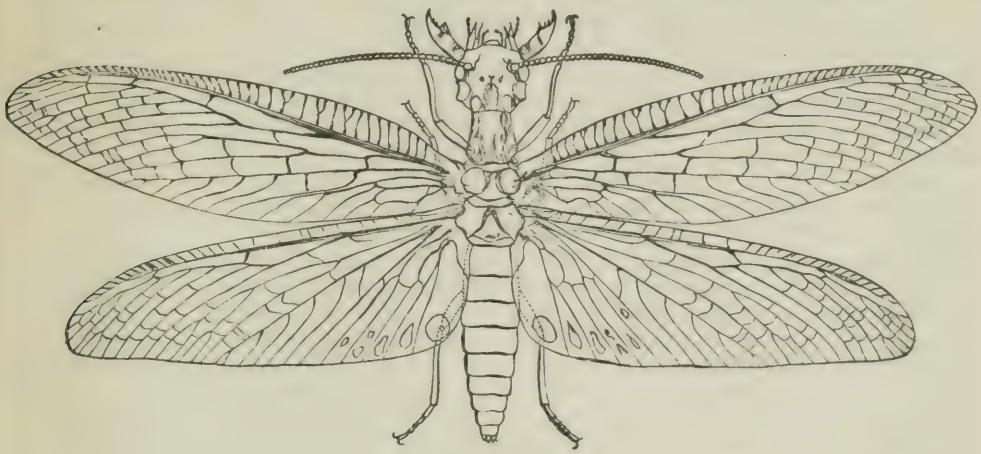


Fig. 6.

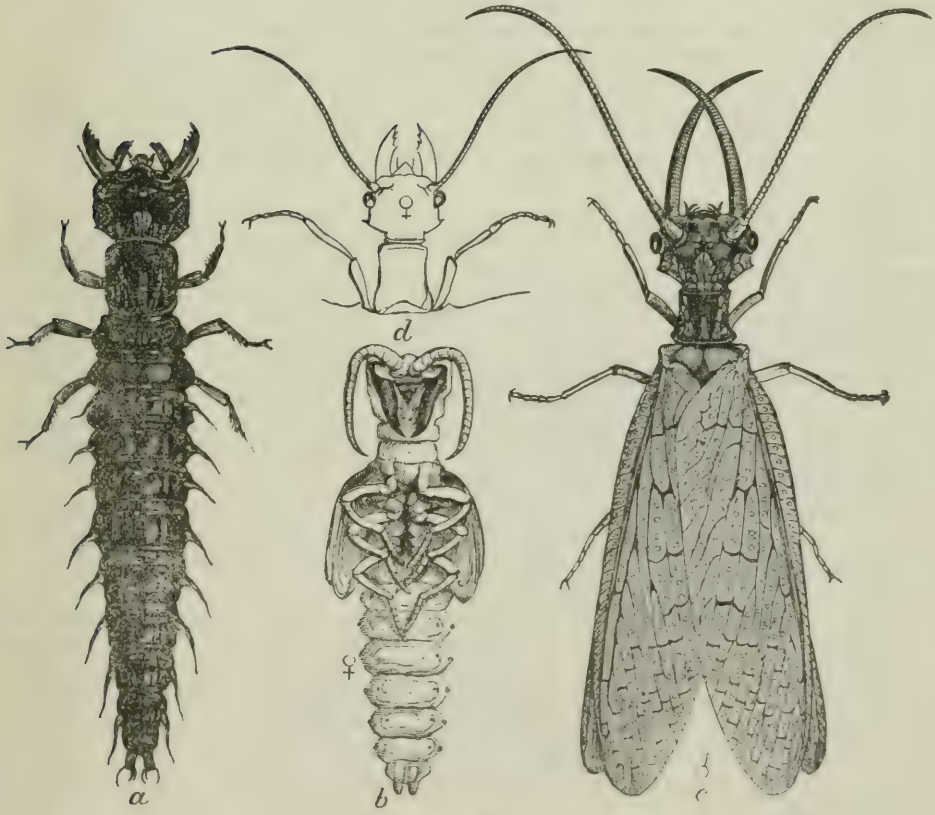


Fig. 7.

In June and July of 1880 this desire, as regards myself, was, in a measure, gratified. I had the pleasure of watching the insect through its changes, from its larval to its pupal condition. The circumstances were these:—

On the 12th of June a lad brought me a strange creature which he had captured as it was crawling up the bank of the Yamaska River. (See *a*, Fig. 7.) It was four inches long, and about half an inch broad. Its colour was dark sepia. It had twelve segments beside the head. The first three of these were evidently thoracic, for the legs were attached to them, a pair to a segment. Each of the nine abdominal segments carried two remarkable appendages, one on either side, inclosing, I suppose, the branchiæ or gills. They were about a quarter of an inch in length, and gave the insect a fringed appearance. On the last segment they approached and over lapped the anal setæ. The square head of the insect was suggestive; and I said, "This must be the larva of the Horned Corydalis," and I took measures for its safety.

I procured a large flowerpot and half filled it with earth. In this earth I sank to the brim, a saucer full of water. I then put in the larva, and covered the pot with a pane of glass. The creature buried itself on the second day; I left it undisturbed for a week and then thought I would remove the earth carefully until I came to it, but, on lifting the saucer, I found that I had no need to do more for the larva lay exposed before me—it had formed a cist immediately under the saucer. In this cist it remained inactive until the 28th of the month, when it underwent a change. The skin of the three segments next the head divided down the back, and the pupa (*b*. Fig. 7) made its *debut* through the opening. The metamorphosis was very striking. Instead of the dark, muddy larva with all its grotesque, tag-like appendages, there lay the bright, clean, yellow pupa, with rudimentary wings and antennæ, and with eyes shewing blue through the waxen skin. Spiracles appeared along the sides; the branchiæ had been cast off; the six legs were drawn up under the body. The creature was very sensitive, either to the light or to the slight jar occasioned by the removal of the saucer, or, it may be, to both, for it became uneasy, and, although it could use neither wings nor legs it worked itself out of its cist and made a complete tour of its prison yard, drawing itself along by its formidable jaws, which, at this stage, closely resembled those of the female imago. In a few days a change of colour began to show itself, and gradually the whole body of the insect darkened with the same hue.

The change to the imago took place in the afternoon of the 12th of July. The skin was rent in the same way as that of the larva had been, and the perfect insect crept from its ruptured envelope. It crawled up a slight frame work which I had placed for its convenience, shook out its wings, and in a few minutes assumed its full proportions. One thing surprised me greatly: I had expected to see a *female* insect appear from the case, for the mandibles of the pupa had been, as I have said, of the exact size and shape of those of the female imago; but the creature on making its appearance presented the preposterously long and scythe-shaped mandibulæ of the male. These frightful appendages are doubtless weapons of offence, for the creature showed its *vim* by striking with them viciously at my finger. So eager was it for a fray, that, in following my hand with repeated snaps, it drove the weapons through its own extended wings.

Although the mandibles of the male *C. cornutus* are of use to the insect for attacking a foe, I doubt whether this is the only or the chief purpose for which they are intended. I imagine that in the nuptial flight they are used for grasping the well-defended neck of the female.

C. cornutus lays its eggs (about 3000 in number) in masses on the stones and piles projecting from the river, where they are soon submerged or on the leaves of trees overhanging the stream. It surrounds and covers them with a white albuminous secretion. The numerous larvæ of the insect, which are called "crawlers" by fishermen, furnish a grand supply of food to our fresh-water fish, especially to the bass. I purchased lately in Montreal a clever imitation of the full grown larva for the angler's use.

We have now to consider the Case-worm, Cod-worm, Cadow, or Caddis, (larva), Caddis-fly (imago).

PHRYGANEA.

The old English word *Cadas means a case for security. The word still lingers in tea-caddy. The case-worm or larva of *Phryganea* is a soft-bodied creature, but it has a firm head and strong jaws. It is supplied with six legs, well adapted for locomotion, and with two hooks at the end of the tail by which it secures itself in its case. It is a rapacious and pugnacious insect. It feeds upon fresh-water molluscs, larvæ, polyps, etc. As a builder it makes use of the materials at hand. The old Free Masons may have taken a lesson from it, and Longfellow might have had it in mind when he sang,—

"That is best which lieth nearest
Shape from that thy work of art."

Sometimes the case is made of sticks, sometimes of grains of sand, and, in Great Britain, sometimes of the shells of the small river-snail (Planorbis), even while their proper owners have them in occupation. The cases not only serve for protection but for anchorage also, and they are found to be heaviest where the current is strongest—the creature having added materials to increase the weight.

If the caddis be deprived of its case, it will at once set to work to construct another; and, in confinement, it will build of materials supplied to it, such as small fragments of glass and coral and the broken teeth of combs. However rough the outside of the case may be, the inside is perfectly smooth, for it is lined with the same cement which binds the materials together, and which is exuded from the mouth of the creature.

It is interesting to watch the caddis shifting his ground, moving his habitation from one part of the river-bed to another. So much of the body as will allow the legs free motion is protruded and the creature strains like a horse with a heavy load, whilst its dwelling moves forward more or less steadily accordingly as it presents a smooth or roughened surface.

Before the *pupa* change takes place the caddis draws itself entirely into its snug quarters, and spins a strong netted covering over the entrance of the case. Having thus "barred the door" against intrusion, it dozes off into the long sleep, the waking from which shall be an introduction to a new life, in another element.

The Phryganidæ in their perfect state differ from others of the Neuroptera, in that they are covered with minute hairs. Hence Westwood and other English naturalists have classed them as a separate order, the Trichoptera (Gr. Θριξ, hair; πτερον, a wing) or hairy-winged insects.

In dress the Phryganidæ are a sober people—browns, drabs and yellows are their favourite colours. Cross-venations give their wings a netted appearance. Their antennæ are long—in some instances very long, and the wings are carried longitudinally. The females deposit their egg masses early in August on some surface projecting from the flood. Westwood tells us (Int. to Mod. Class. of Ins. Vol. II. page 62) that occasionally they descend the stems of water-plants and lay them under water. The egg-mass resembles miniature frog-spawn. It is an accumulation of drops of gluten containing embryons in the form of minute green specks. The young larvæ burst forth in September, and proceed at once to construct their dwelling. They afterwards repeatedly "lengthen their cords and strengthen their stakes" according to their requirements.

"Our rivers abound with *fish* of various kinds, which at particular seasons derive a principal part of their food from insects, as the numerous species of the salmon and carp genus. These chiefly prey upon the various kinds of Trichoptera in their *larva* state called case or caddis-worms, and in their imago, May-flies." (*Kirby and Spence, Int. to Ent. Letter IX.*)

The adult Salmon proper, *Salmo salar*, is believed by the best authorities, to eat little or nothing during its sojourn in fresh water. It leaves the ocean fat and returns to it emaciated. The above remark, therefore, does not apply to *Salmo salar*; but it does apply

*Kaddos, dim. of Kados, Gr. Parvus cadus, a small pot or jar, a ballot-box. See Schrevelii by Robertson, A. D. 1676.

to others of the genus, and especially to the English *Salmo fario*, or common trout; and the Canadian *Salmo fontinalis*, the brook trout; and *Salmo naymacush*, the Lunge. The lake shad (*Coregonus albus*), also is well known to have a keen relish for the Phryganidæ in their winged state.

CONCERNING ANTS.

BY G. J. BOWLES, MONTREAL.

Although everyone has seen ants, and thinks he knows something about them, there are not many who are well acquainted with their real history. The general knowledge of them and their habits is limited to a few facts; such as that they live in societies, seem always to be at work, and sometimes get into our dwellings, where they are regarded as a nuisance, and treated accordingly. To those, however, who have closely observed them, they have become objects of great interest. The studies, begun by Gould, De Geer, Latreille, P. Huber and others, have since been carried on by many naturalists; particularly, in our own day, by Sir John Lubbock in England, and the Rev. Dr. McCook in America, until a large amount of information has been gathered with regard to their economy. The secrets of their little lives, apparently so trivial, have been discovered, and their wonderful instincts and habits patiently unfolded, until the conclusion has been reached, that they stand highest of all the insect race with regard to intelligence. Indeed, Sir John Lubbock declares that, "when we consider their habits, their social organization, large communities and elaborate habitations, their roadways, their possession of domestic animals, and even in some cases of slaves, it must be admitted that they have a fair claim to rank next to man in the scale of intelligence." In this respect, the Anthropoid Apes, so closely related to man in structure, and which so many naturalists would fain consider as our ancestors, sink far below these little creatures. For, until we find among the apes farmers, cattle owners, miners, engineers, builders, soldiers, and even gentlemen slave owners, as we do among the ants, we must consider the statement of Sir John Lubbock to be true.

In another aspect, ants are worthy of our notice. In all ages they have been used to "point a moral," and their industry and foresight held up as an example to the sluggard and the improvident. The Royal naturalist—the foremost entomologist and botanist of his age—places the ant among the "four things which are little upon earth," but are "exceeding wise;" and since his time, many a philosopher and moralist has drawn lessons from its proceedings.

Ants belong to the order Hymenoptera, the highest order of the insect world as regards organization and instincts. A society of ants is composed of at least three or four classes of individuals, males, females, neuters or workers, and, in some species, soldiers. The males and females, when first produced, have four membraneous wings; the neuters, however, are born without these appendages. The males, after having performed their allotted part, die off and disappear. As among the bees, the female (of which there are nearly always one or more in each nest) is the acknowledged head of the community, and performs duties similar to those of the queen bee. Unlike the latter, however, when reigning she is always wingless. The four gauzy wings which she possessed when she issued from the parent nest are gone, either stripped off by the neuters, or voluntarily discarded by the insect herself. The latter operation has been often witnessed. I once saw a number of large ants (Formica herculeana) denuding themselves in this way. They flew to a small dead tree in my garden, and alighted on the branches. Then, by moving their wings in every direction, they at last disconnected them from their bodies. The discarded wings fell slowly to the ground, and the ants contentedly crawled down the trunk of the tree, and went off in different directions to begin their new life. The neuters or workers form the great bulk of every community. They are smaller than the males and females, and, in many species, are divided into two classes, workers and soldiers, the

latter being larger in size and having larger heads than the others. These larger individuals are called soldiers, because they conduct the warlike operations of the community, both offensive and defensive. All the work of the nest is performed by the neuters, such as building, excavating, the procuring of food, and the care of the young.

This outline gives an idea of the constitution of an ant community as a whole, and the duties pertaining to the several classes of individuals comprised in it. It is a curious fact, however, that notwithstanding the researches of many excellent observers, and though ants' nests swarm in every field and wood, we do not know how these nests are commenced. Sir John Lubbock says, "Whether the queen joins an old nest, or associates with a certain number of workers to form a new one, or founds a new one for herself, is uncertain. Experiments have been carefully tried with single females, but they have nearly always failed, the queens, when isolated, not seeming to be capable of rearing the larvæ to maturity; and as the inhabitants of old nests usually act in a hostile manner towards females introduced into their nest, even when they are without a queen, it is probable that the founding of a new community is generally the result of a queen being joined by a number of workers. Nests have been known to exist for a long time without a queen, the society becoming, in fact, a republic; and in such a case, it is difficult to induce the ants to accept a new one, and return to the old form of government."

In the early summer large numbers of winged males and females are produced in the nests, but the pairing time does not arrive until much later in the season. If a nest be opened in midsummer, it will generally be found to contain these winged individuals, mixed with the wingless neuters,* who are said to prevent the others from leaving the nest until the proper time has come. Then they make their escape into the air, and what is called the "marriage flight" takes place. "Sometimes many nests will unite their swarms, which rise in columns with incredible velocity, and soar to a great height. Each column looks like a kind of slender network, and has a tremulous undulating motion. The noise emitted by myriads and myriads of these creatures does not exceed the hum of a single wasp, and the slightest zephyr disperses them." During this flight pairing is supposed to take place.

When a new community is formed, the workers immediately begin to prepare a habitation for it, either in the ground, or in whatever situation is in accordance with the instincts of the species. The queen begins to lay eggs, which the workers take charge of, and soon the whole business of the nest is actively in operation. Building is carried on, food is brought in, the young are safely reared, and the society quickly increases in numbers and prosperity. Unlike the nests of wild bees and wasps, which last only for one season, the settlements of ants may be called permanent, as the same nest is used year after year, and the losses by death and emigration are replaced by natural increase. This is one of the singular analogies which may be traced between the ant and mankind. During winter, in cold countries, the inhabitants must become torpid, as ants live for several years in the perfect state. Sir John Lubbock has had the same individuals in his formicaries for at least seven years, and even then they did not show any signs of old age.

Some kinds of ants feed wholly, or chiefly, on animal substances, other kinds on vegetable.

Great numbers of insects are destroyed by them, even in temperate climates, while in the tropics they devour rats and other small animals. In this way they are very useful, and the visitation of certain species in South America is looked upon by the inhabitants as a blessing. These ants travel in vast swarms, enter into the houses, and exterminate in a short time the vermin with which they are infested. To those which live on vegetable substances some of the most interesting species belong. In Canada, with its cold winters, it is not probable that we have any ants which lay up a store of food, as in the cold season the insects are torpid. But in warm climates it is otherwise. In India a species is found *Atta providens*, which not only stores up provisions, but of

* I opened a nest of F. fusca on the 25th June last, and found it as above stated.

which the stores consist of the seeds of a species of millet; and in the south of Europe, several species of the same genus, particularly *Atta barbara*, (See Fig. 8,) and *Atta structor*, lay up large stores of grain and seeds. Not only so, but the seeds stored up by them, seem, in some way not yet known, to be deprived of the power of germination. The history of the agricultural ants of Texas, given by the Rev. Dr. McCook in his book, is most wonderful. This species is represented in Fig. 9, and is known as *Myrmica barbata*. They make flat circular clearings from two or three to twelve feet in diameter, with roads diverging into the surrounding herbage, often of great length, and during working hours these roads are thronged by ants going and returning. In the middle of the day they take a *siesta* for two or three hours. The seeds, principally of rubiaceous plants and grasses, are gathered off the ground, and carried into the granaries, where they are shelled and the husks brought out and deposited in heaps. It seems even possible that they sow the seeds of a grass called *Aristida stricta* for themselves, though the author does not vouch for this. The supposition is not incredible, when we consider the intelligence displayed by these ants in regard to other things.

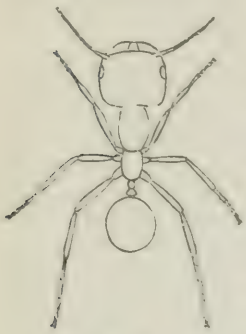


Fig. 8.

Atta barbara, worker, harvesting ant of Europe. (From Lubbock.)

Ants are extremely fond of sugar, in fact, saccharine substances are the principal food of many species. The love of ants for the *Honeydew* exuded by the *Aphides* or Plant lice is a well ascertained fact, and with this some of their most extraordinary instincts are connected. They climb the plants on which the aphides are found, that they may obtain this food, and have been seen to wait beside them for new drops, even touching them with their antennæ, in order to cause the drops to flow, patting the abdomen of the aphis on either side alternately and rapidly; the ant, after the drop has been obtained, passing on to another aphis. The whole process has been likened to the milking of cattle. Even more wonderful things are asserted on this subject, as that particular ants seem to regard particular aphides as their own property, and are ready to fight in defence of their right, that, to secure them for themselves, they convey them from one place to another,—and that the *Aphis radicum*, which derives its nutriment from the roots of grass and other plants, is actually kept in large numbers in the nest of the Yellow Ant, (*Formica flava*,) in order that they may have always at hand a copious supply of food, these aphides and their eggs sharing the solicitude of the ants equally with their own eggs and young. These statements, though apparently incredible, are yet the conclusions arrived at by careful and scientific observers.

Fig. 9.

Myrmica barbata, agricultural Ant of Texas, carrying seeds to granary. (Rev. J. G. Wood.)

In addition to aphides, ants often have as fellow-lodgers, certain species of small beetles, and even other insects.

It is not certainly known why the ants harbour and care for them, as ants are generally hostile to other insects, but the facts are well authenticated. No doubt the owners of the nests derive some benefit from their presence, or they would not be allowed to remain. In the Entomological Annual for 1857, Mr. Edward W. Jansen has an article on the ants-nest beetles of Britain, giving the names of thirty-six species which have been found in the nests of five different species of ants. About fifty species of beetles have been ascertained by continental entomologists to pass at least a portion of their lives in the nests of various species, not as mere intruders, but as cherished friends, over whom

their hosts "watch with the greatest solicitude, bearing them tenderly back should they stray away, and hurrying them off to the innermost recesses of their subterranean burrows at the appearance of danger." Two years ago I examined a number of ants' nests on Montreal mountain, and found in many of them a species of small beetle which seemed to be at home, and friendly with the owners of the nests. I could not get it named in Montreal. No doubt our American species have habits in this respect similar to those of the European ants. The subject is a curious one, and worthy of the attention of our entomologists.

The nests of ants are of many different kinds. Some species make them altogether under the surface of the ground others build theirs in the shape of a dome, the galleries and chambers being both above and below the surface level. None of our Canadian ants make nests of any great size. The largest ant-hills formed by any British species are those of *Formica rufa*, which are sometimes as big as a small hay-cock, but in South America, ant-hills are found of fifteen or twenty feet in height. Inside the nest are numerous small apartments, arranged in separate stories, and communicating with each other by means of galleries. Many of the species of those called Mason Ants construct their habitations in a much more elaborate manner, making use of soft clay which they knead and mould with their mandibles and feet. The partition-walls of the galleries and chambers of *Formica brunnea* are about one-twentieth of an inch thick, and half an inch high; the roofs somewhat arched, and pillars are made use of as supports. Fig. 10 shows the nest of *Formica nigra*. Huber saw a working ant of another species (F. fusca), without assistance, make and cover in a gallery two or three inches long, with a roof a perfect concave. Other species, the Carpenter ants, make their homes in the trunks of old trees, gnawing the wood into apartments and galleries, with floors and partitions as thin as card. *Formica flava* builds its partitions of a sort of *papier-maché* of sawdust, earth and spider's web. An East Indian species, *Myrmica Kirbii*, forms a globular nest of a congeries of tile-like *laminae* of cowdung, the interior exhibiting a series of apartments and galleries. And some in Australia form theirs of the leaves of trees glued together, after being first brought into position by the united strength of multitudes. Amid this endless variety, each species prepares its habitation as prompted by its special instinct, performs its task in a perfect manner, and with an industry and perseverance which cannot be excelled.

Fig. 10.

Typical nest of *Formica nigra*. A, entrance; B, hall; C, large chamber; D, sanctum; E, pillars; F F, entrances to sanctum. (From Lubbock.)

More than a thousand species of ants are known, and they are generally distributed over the temperate and tropical regions of the globe. In tropical countries they are more numerous in species and individuals than with us, and present a greater variety of instincts and habits. The ants of temperate climates are, if we may so speak, more civilized than the others: more of the species have settled habits, and they lead quieter lives than the ants of the tropics. It is true that some of the European ants are predatory and warlike, and some have a liking for making slaves of their neighbours and keeping them in bondage, but none of them can compare with the Foraging Ants of South and Central America for fierceness and bloodthirstiness. These Ants (Eciton) appear to have no fixed place of abode, but shift their camp at intervals of a few days, and live by predatory forays, hunting in organized bands and ravaging the nests of other species, or even attacking small animals. One of the best known species is *Eciton predator*, a small ant which hunts in dense hordes, and marches rapidly over a territory. A moving phalanx of this species will extend over from four to six square yards; and any unwary insect meeting with, or falling into the serried ranks, is soon torn to pieces and devoured. *Eciton hamata* hunts both in dense masses and in detached columns. The

nature of the prey appears to regulate the mode of march. Thus, when proceeding in columns, Mr. Belt found that *hamata* was in search of the nests of another ant of a different genus (*Hypoclinea*), the larvæ and pupæ of which they seize for the purpose of bringing them up as slaves. The Hypoclineas, who are of rather meek disposition, and

Fig. 11.

Fig. 12.

Fig. 13.

make no effort at self-defence, rush out of their nest on being attacked, and strive to escape, bearing their young in their jaws, but the Ecitons at once seize the young ants, although they never appear to injure the parent Hypoclineas. Although so cruel in disposition, these Ecitons are endowed with much intelligence, and in their expeditions often show a capacity for overcoming difficulties, which really merges on reason. Thus, in crossing a crumbling slope, which was gradually disintegrating under the passage of the ant-army, a portion of the band, by adhering to each other, formed a solid pathway, over which the others passed safely. On another occasion a twig formed a bridge over a

Fig. 14.

Œcodoma cephalotes, worker Parasol Ant, Brazil. (Rev. J. G. Wood.)

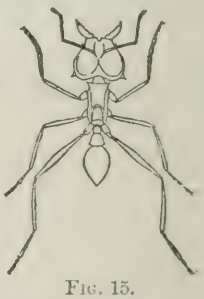


Fig. 15.

Œcodoma cephalotes, worker Major, Brazil. (From Lubbock.)

small rill; but this proving too narrow for the transit of the army, it was widened by ants clinging to each side of the twig, and in this way the track was broadened sufficiently to admit of the easy passage of the mass. (Fig. 11 represents Eciton Mexicana; and Fig. 12, E. sumichrasti; and Fig. 13, E. drepanophora.)

The leaf-cutting ants (Œcodoma) are noted pests of central and tropical America, and commit fearful havoc among trees, laboriously and persistently carrying off in their mouths, piece by piece, the foliage of trees and shrubs. The orange, lemon and mango trees, in particular, suffer from their attacks. Central America is also the home of a gigantic black ant, about one inch in length, and armed with a formidable sting. These ants are notable for their solitary habits, and represent, in their family, the solitary wasps among the Vespidæ. Fig. 14 represents Œcodoma cephalotes, worker; and Fig. 15, worker Major.

Fig. 16.

Myrmecocystus Mexicanus, Honey Ant of Mexico. (Rev. J. G. Wood.)

There is a remarkable species of ant found in Mexico, in which certain individuals in each nest serve as animated honey-jars, Myrmecocystus Mexicanus. (See Fig. 16.) To them the foragers bring their supplies, and their whole duty seems to be to receive the honey, retain it, and re-distribute it for food when required. The abdomen of these ants becomes enormously distended; the intersegmental membranes being so much stretched, that the chitinous segments, which alone are visible in ordinary ants, seem like small brown transverse bars. These individuals never leave the nest. A similar habit prevails in an Australian species, *Camponotus inflatus*, which is shown in Fig. 17.

The slave-making propensity has been carefully studied in some European species, and much interesting information regarding it placed on record. Huber was the first

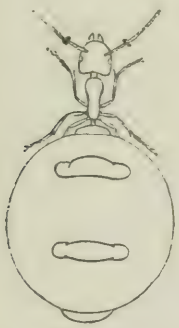
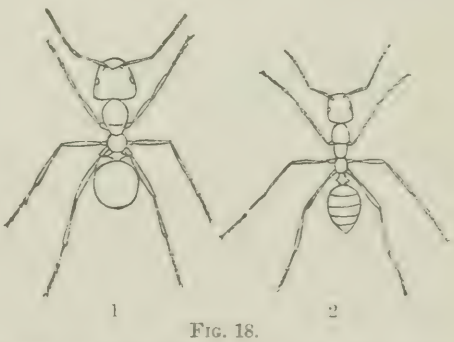


Fig. 17.

Camponotus inflatus, (Lubbock.) Honey Ant of Australia (magnified twice).



1 2

Fig. 18.

1. *Formica sanguinea*, worker. 2. *Polyergus rufescens*, worker. Both slave-making species, Europe. (From Lubbock.)

observer who discovered the existence of slavery among ants. There are several species which have the habit, some in a stronger degree than others: and it is singular that the institution has had a most degrading effect on those which seem most addicted to it. *Formica sanguinea*, (see Fig. 18,) found in the southern counties of England and throughout the Continent, is a species with which the habit has become established. They make periodical expeditions, attack neighbouring nests, and carry off the pupæ. When the latter come to maturity, they find themselves in a nest consisting partly of *F. sanguinea* and partly of their own species, the result of previous expeditions. They adapt themselves to circumstances, assist in the ordinary household duties, and, having no young of their own species, feed and tend those of the *sanguineas*. But though the *sanguineas* are thus aided by their slaves, or, as they should rather perhaps be called,

their auxiliaries, they have not themselves lost the instinct of working. It seems not improbable that there is some division of function between the two species, but we have as yet no distinct knowledge on this point; and at any rate the *F. sanguineas* can "do" for themselves, and carry on a nest, if necessary, without slaves. The ants usually enslaved by this species are *F. fusca*, which is found in Canada.

Another species, *Polyergus rufescens*, Fig. 18, No. 2, is much more dependent on its slaves, being, indeed, almost entirely so. Even their bodily structure has undergone a change, their mandibles have lost their teeth, and become useless save as warlike weapons. They have lost the greater part of their instincts, their art of building, their domestic habits,—for they show no care for their young, all this being done by slaves; their industry,—they take no part in providing their daily supplies: if the colony changes the situation of its nest, the masters are all carried by the slaves on their backs to the new one; nay, they have even lost the habit of feeding. Huber placed thirty of them with some larvæ and pupæ and a supply of honey in a box. "At first," he says, "they appeared to pay some little attention to the larvæ: they carried them here and there, and presently replaced them. More than one-half of the Amazons died of hunger in less than two days. They had not even traced out a dwelling, and the few ants in existence were languid and without strength. I commiserated their condition, and gave them one of their black companions. This individual, unassisted, established order, formed a chamber in the earth, gathered together the larvæ, extricated several young ants that were ready to quit the condition of pupæ, and preserved the life of the remaining Amazons." These so-called workers of *P. rufescens*, though thus helpless and idle, are numerous, energetic, and in some respects almost brilliant, but their energies are devoted to the war-like spoliation of their neighbours.

In another slave-making ant, *Strongylognathus*, the workers are much less numerous, and so weak that it is an unsolved problem how they procure their slaves, a species called *Tetramorium cæspitum*. Nevertheless, they are always found with the latter, and in these mixed nests there are no males or females of *Tetramorium*, but only those of *Strongylognathus*. Another genus, *Anergates*, has a history still more extraordinary. It differs from the others in having no workers, the nests in which it is found consisting of males and females only, of *Anergates*, and the workers only of *Tetramorium*. The male, as well as the female, is wingless, and they are absolutely dependent upon their slaves, and cannot even feed themselves. How they obtain the mastery over the workers is a problem which has not yet been solved. Sir John Lubbock suggests that a male and female make their way into a nest of *Tetramorium*, and in some manner contrive to assassinate their queen. If this was done, we should find the following year a community composed of the two *Anergates*, their young, and the *Tetramorium* workers, in the manner described by Van Hagens and Forel.

Sir John Lubbock says that "these four genera offer us every gradation from lawless violence to contemptible parasitism.

"*Formica Sanguinea*, which may be assumed to have comparatively recently taken to slave-making, has not as yet been materially affected.

"*Polyergus*, on the contrary, already illustrates the lowering tendency of slavery. They have lost their knowledge of art, their natural affection for their young, and even their instinct of feeding! They are, however, bold and powerful marauders.

"In *Strongylognathus* the enervating influence of slavery has gone further, and told even upon their bodily strength. They are no longer able to capture their slaves in fair and open warfare. Still they retain a semblance of authority, and, when roused, will fight bravely, though in vain.

"In *Anergates*, finally, we come to the last scene of this sad history. We may safely conclude that in distant times their ancestors lived, as so many ants do now, partly by hunting, partly on honey; that by degrees they became bold marauders, and gradually took to keeping slaves; that for a time they maintained their strength and agility, though losing by degrees their real independence, their arts, and many of their instincts; that gradually even their bodily force dwindled away under the influence to which they had subjected themselves, until they sank to their present degraded condition—weak in body and mind, few in numbers, and apparently nearly extinct; the miserable representatives

of far superior ancestors, maintaining a precarious existence as contemptible parasites of their former slaves."

Putting to one side, however, the slave-holding ants, we find in the different species different conditions of life, curiously answering to the earlier stages of human progress. Thus some species, such as *Formica fusca*, live principally by the chase, for, though they feed partly on the honeydew of aphides, they have not domesticated these insects. They resemble the lower races of men, who subsist mainly by hunting. They frequent woods and wilds, their communities are small, they hunt singly, and their battles are single combats, like those of the Homeric heroes. *Formica flava* represent a higher type of social life. They show more skill in architecture, have domesticated certain species of aphides, and may be compared to the pastoral stage of human progress—to the races which live on the produce of their flocks and herds. Their communities are more numerous, and they know how to act in combination. Lastly, the agricultural nations may be compared with the harvesting ants.

Mental Character.

Our present knowledge of the life history of ants is due not only to observations made upon them in the field, but also to close study of captive communities. P. Huber seems to have been one of the first to establish formicaries, and his account of his efforts and success are very interesting. The idea, however, has been recently carried out to a much greater extent, and with greater success, by Sir John Lubbock, the well-known English naturalist, who, for several years past, has had from thirty to forty communities under observation at one time, comprising some fifteen of the British species, and many of the foreign forms. Fig. 19 shows one of these formicaries. His nests are formed of two plates of common window glass, about ten inches square, kept apart at a distance of from one-tenth to one-quarter of an inch by wooden slips round the edges, leaving a small space at one corner for an entrance. The space between the two panes of glass is filled with fine earth, and when the ants have taken possession, they tunnel out the earth, and thus form their chambers and galleries. These nests are placed on shelves, swinging on a central support, one above another, and some five or six inches apart. The nests can thus easily be turned round for inspection. Below all is a larger platform, with a deep groove round it filled with water, to prevent the ants wandering away from the apparatus.

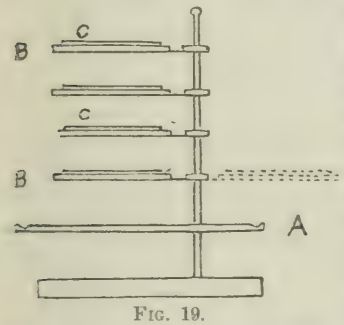


Fig. 19.

Stand for nests—A, lower platform, with moat for water; B, swinging shelves; C, nests. (Lubbock.)

It is easy to induce the ants to live in one of these nests, if the right way is known. Sir John Lubbock says, "When I wished to start a new nest I dug one up and brought home the ants, earth, etc., all together. I then put them over one of my artificial nests, on one of the platforms surrounded by a moat of water. Gradually the outer earth dried up, while that between the two plates of glass, being protected from evaporation, retained its moisture. Under these circumstances, the ants found it more suitable to their requirements, and gradually deserted the drier mould outside, which I removed by degrees."

In these nests, when they had become accustomed to their new quarters, the insects carried on their usual labours as freely as in their native haunts, and afforded special facilities to the patient naturalist for observing the internal economy of ant life. And he has not only studied them in communities, but has made careful observations on individual ants, which have afforded many new and curious facts with regard to their dispositions and habits.

Let us look at one of these nests, say of *Formica fusca* (a species also found in Canada), and represented in Fig. 20, and note the domestic economy of the inmates. They form an organized society of perhaps several hundred individuals, the head of which is

the queen ant, and all work harmoniously together for the general good. The fact, however, that their food is provided for them, releases them from a task which must take up

Fig. 20.

Formica fusca, Canadian and European species, female, worker and male. (From Westwood.)

a great part of the time and labour of a community living in a free condition. With a supply of honey at their very door, it is not necessary to hunt over the whole neighbourhood for something to eat, which, when found, would perhaps be no better than the "dried grasshopper's leg," immortalized by Mark Twain in his "Tramp Abroad." But this gives them more time for their other duties—building, excavating, and "cleaning up," and also for that most important work, the care of the "rising generation," in the shape of the eggs, larvæ and pupæ belonging to the nest. The eggs hatch in from two to six weeks after being laid by the queen ant, and produce small white legless grubs, somewhat conical in form, being narrow towards the head. "They are carefully tended and fed, being carried about from chamber to chamber by the workers, probably in order to secure the most suitable amount of warmth and moisture. I have observed, also, that they are very often assorted according to age. It is sometimes very curious in my nests to see them arranged in groups according to size, so that they remind one of a school divided into five or six classes." In this stage they live for several weeks, and grow rapidly. When full grown they turn into pupæ, sometimes naked, sometimes covered with a silken cocoon, constituting the so called "ant-eggs." After remaining some days in this state, they emerge as perfect insects. In many cases, however, they would perish in the attempt, if they were not assisted: and it is very pretty to see the older ants helping them to extricate themselves, carefully unfolding their legs and smoothing out the wings with truly feminine tenderness and delicacy. The very young ants do not at first take any share in the defence of the nest or other out-of-door work, but help in the care of the larvæ and pupæ, until their skin has hardened. Then they take part in the general labours of the society. How far, however, the "division of labour" system is carried, has not yet been ascertained. But there are good reasons for thinking that it is followed out to some extent, as several of Sir John Lubbock's observations point in this direction. One of these was as follows:

"In summer the ants moved freely about the stand, and each one fed itself, but when the weather became cold and gloomy, and the ants required but little food, they remained indoors, and deputed to certain individuals the duty of procuring supplies for the whole community. During the winter, two nests of different species were kept under constant observation, and the foragers were marked, so that they could be identified. One of the nests was a large community of *F. fusca*, and it was found that the whole supply of food for this nest was carried in by the same four or five ants for a period of several weeks. The other nest was of *Polyergus rufescens*, a slave-holding species. In this case the mistresses never came out for food, leaving the work to three slaves, who carried it into the nest daily for the two months during which the observations continued."

The inmates of a nest are bound together by ties of friendship, and have a strong feeling of attachment to their own community. Hence some species—like the old Highland clans—regard other nests, even of their own species, as enemies, and will not allow a stranger ant to remain among them. Other species, however, are not quite so exclusive. The inhabitants of a nest all recognise one another; a wonderful fact, when we consider the number of individuals in some of their settlements. In the larger societies of *Formica*

pratensis (in a wild state), there are probably from 400,000 to 500,000 ants, and in other cases even these large numbers are exceeded. Yet they not only recognise each other while living together, but even after living apart for a long period. Thus Sir John Lubbock separated one of his colonies of *F. fusca* into two halves, and kept them entirely apart. At different times he put specimens from the one half into the other. At first they were always amicably received, but after some months' separation, they were occasionally attacked, as if some of the ants, perhaps the young ones, did not know them. The mistake, however, was always rectified in a short time. The last three ants were put back after a separation of a year and nine months, yet they were well received, and evidently recognised as friends. *Formica fulvacea* is shown in Fig. 21.

Fig. 21.

Further experiments were made by this accomplished observer, with pupæ taken from a nest and brought up by stranger nurses. Even these young ants, when placed in the nest from which they had been taken as pupæ, were acknowledged as friends. But when they were put into the nest from which their nurses had been taken, they were always attacked. A still more extraordinary fact is, that ants will recognise the claims of consanguinity even in young ants taken from their nest in the *egg* state, and brought up wholly by strangers. How this recognition of their friends is effected, is a mystery. Signs, passwords, the sense of smell, have all been suggested by naturalists as the solution of the problem, but none of these are fully satisfactory.

Besides this power of recognising their friends, there is no doubt but that they have the power of communicating information to one another. Indeed, their acting in concert in large numbers, for some special object—as in their warlike expeditions—is a proof of this, for without this faculty, such combinations would be impossible. Sir John Lubbock tried many experiments with marked specimens, and came to the conclusion that ants can impart information to their fellows, but the *modus operandi* could not be made out. It seems to be connected in some way with signs given by touching with the antennæ, which, (according to Huber and others), they use freely in this manner. That it is imparted by sound, is not probable, unless ants can hear sounds which to us are altogether inaudible. Sir John Lubbock attached an extremely sensitive microphone to one of his nests, for the purpose of testing this point. The ants could be distinctly heard walking about, but no other sounds could be distinguished.

The industry of ants has long been celebrated. They work literally day and night. Sir John Lubbock says, "I once watched an ant from six in the morning, and she worked, without intermission, till a quarter to ten at night. I had put her to a saucer containing larvæ, and in this time she carried off no less than a hundred and eighty-seven to the nest. I had another ant, which I employed in my experiments, under continuous observations several days. When I started for London in the morning, and again when I went to bed at night, I used to put her in a small bottle, but the moment she was let out she began to work again. On one occasion I was away from home for a week. On my return I took her out of the bottle, placing her on a little heap of larvæ about three feet from the nest. Under these circumstances I certainly did not expect her to return. However, though she had thus been six days in confinement, the brave little creature immediately picked up a larvæ, carried it off to the nest, and after half an hour's rest, returned for another."

If they work so hard, why should they not sometimes play? Huber mentions scenes which he had witnessed on the surface of ant hills, which strongly resembled sportive games. The ants raised themselves on their hind legs, caressed one another with their antennæ, engaged in mock combats, and almost seemed to be playing hide and seek. Gould, an old English observer, also mentions having seen similar "amusements." Even the terrible *Ecitons* sometimes relax. Bates observed behaviour, in the case of *Eciton legionis*, which looked like simple indulgence in idle amusement: the conclusion, he says, "that the ants were engaged merely in play was irresistible."

Ants are very cleanly, and assist one another in this respect. They are often seen licking one another, and those which Sir John Lubbock marked with paint, for the purpose of identification, were gradually cleaned by their friends. Those, too, which die in the nest, are always carried outside, and in the cases observed by Sir John Lubbock, were generally thrown into the moat surrounding his apparatus.

As to their friendly feelings towards each other, it is shown to a different degree by different ants, for, like men, they differ in individual character. Of course, in carrying on their ordinary avocations, they act together with great harmony, but it is in exceptional circumstances that their real character in this respect is revealed. In the case of sick or disabled ants, he has observed, on several occasions, that they were carefully nursed and guarded; while on others, their friends acted more like the Priest and the Levite than the Good Samaritan. Even in the case of ants who had got drunk (not voluntarily, however), their friends picked them up and carried them to the nest to sleep off their potations. But if these intoxicated ants were strangers, they were thrown into the water. Indeed, the experiments proved that though their friendship for each other is strong, their hatred to their enemies is still stronger, for they were willing to leave friends in confinement, if they could only get at stranger ants and maltreat them. No doubt this must be regarded as a blemish in their character.

Senses—Sight, Hearing and Smelling.

As regards vision, the species of ants are very differently endowed. Some have upwards of a thousand facets in their eyes, others less, some *Ecitons* only one. Some species are entirely blind. One of these, *Ponera contracta*, is found in England. Besides the compound eyes, many species are furnished with simple eyes (*ocelli*) on the top of the head.

Whether each facet in an insect's eye acts as a separate organ, or only a part of the object is seen by it, is a question not yet decided by entomologists. The latter, however, is the prevailing opinion, in which Sir John Lubbock, who has made many observations on the vision of ants, is disposed to coincide. "If," he says, "the male of *Formica pratensis*, for example, sees 1,000 queens when only one is really present, it would seem to be rather a bewildering privilege." Still, if we do not know *how* they see, we know that they *do* see, and by taking advantage of their dislike to light in their nests, he found that they were susceptible to colour, and prefer some to others. By placing strips of violet, red, green and yellow glass over their nests, he discovered that they preferred the green and yellow, and particularly avoided being under the violet, and after many elaborate experiments with the magnesium light, the spectra of different substances, etc., he concludes that they have an aversion to that colour, and even that they are very sensitive to the ultra-violet rays of the spectrum, which our eyes cannot perceive. This he considers a very interesting discovery, making it probable that these rays appear to ants as a distinct and separate colour (of which we can form no idea), as unlike the rest as red is from yellow: and that, as light appears to them composed of not only the rays which *we* see, but of those of the ultra-violet, the general aspect of nature must, as regards colour, present to them a very different appearance from what it does to us.

None of the experiments he tried could prove to him that ants had the power of hearing. Tuning forks, penny pipes, shrill whistles, a fiddle, or the most piercing and startling sounds he could produce, had not the slightest effect upon them. Still, he thinks that they may be capable of hearing sounds which we cannot distinguish. In the terminal joint of the antennæ of ants there are several curious structures, which seem to be auditory organs. They are of two kinds, one a cork-shaped organ, opening on the outer surface of the antenna. The other kind is in the form of a stethescope, (see Fig. 22) with an outer sac (s) a long tube (t), and a posterior chamber (w) to which is given a nerve (n).

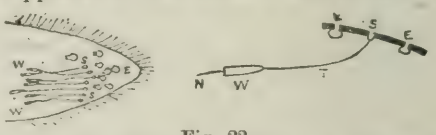


Fig. 22.

Terminal portion of antenna of *Myrmica ruginodis*: K, "cork-shaped" organs. S, opening of "stethescope" on surface. T, tube. W, inner chamber. N, nerve. (From Lubbock.)

Sir John Lubbock has also discovered in the front tibiæ of *Formica flava* an arrangement of the tracheal tubes in a somewhat similar way, which may also serve as a hearing apparatus. A similar organ is seen in the front tibiæ of *Gryllus*, and is thought by some European naturalists of eminence to be for this purpose.

Ants possess a stridulating apparatus on the upper surface of the fourth abdominal segment, which is finely ribbed, and when rubbed, gives out a sound. We see, then, that they are provided with what are presumably organs of hearing, and also with the means of emitting sound, so that although Huber, Forel, and others, state that ants are quite deaf, their perceptions of sound may really be far more delicate than ours, but ending where ours begin.

Their sense of smell is well developed. Their behaviour, when tested with various scents, from assafœtida to lavender water, proved conclusively that this was the case. And it seems to be the principal means of finding their way, more serviceable even than sight, being in fact the keenest and most useful of their senses.

Canadian Species.

The ants of Canada have not been much studied. The following list comprises all the species catalogued up to the present, but, no doubt, it could be much enlarged, as the United States possesses about 200 species. Only two genera have so far been found in Canada.

Genus Formica, (Linn.)
Peduncle of abdomen with one knot.
Discoidal cellule not closed.
- Black, feet and thorax partly red..... *herculeana.*
- Entirely black..... *Pennsylvanica.*
- Brown or black, feet pale..... *pallitarsis.*
- Entirely yellow..... *mellea.*

First discoidal cell closed.
- Black, feet red..... *fusca.*

Reddish or yellowish.
- Yellow or yellowish red, abdomen black..... *rufa.*
- All brownish or reddish yellow..... *flava.*

Genus Myrmica, (Latreille).
Peduncle of abdomen with two knots.
- Bright red and black..... *incompleta.*
- Pale red and black..... *tuberum.*
- Pale yellow, size small..... *molesta.*

F. herculeana, (Linn), ligniperda, (Latr).

This, the largest of our ants, is black, with the feet and thorax partly red. It lives in decaying trees or wood, where it forms numerous galleries. An example of its destructive powers is given by Mr. E. Baynes Reed, in the Annual Report for 1883, page 38. Found also in Europe. F. Pennsylvania, (DeGeer). A somewhat smaller species than the former, but having similar habits. F. pallitarsis, (Provancher). A very small insect, only $\frac{3}{20}$ of an inch long, black, with pale feet. The Abbé Provancher does not mention its habits.

F. Mellea (Provancher). $\frac{1}{10}$ inch long, and of a uniform pale yellow colour. Lives under stones.

F. fusca, (Linn). A well-known species, found also in Europe. It generally makes its nests under stones, in sheltered places. Very common on Montreal Mountain.

Fig. 23.

F. rufa, (Linn). A yellowish red species, common also in Europe. Fig. 23 represents the female of this species. It forms its nests in the earth, covering them with the soil it carries out of its galleries, mixed with bits of wood and other rubbish, so as sometimes to raise considerable mounds. Figure 24 represents one of their nests. In Europe it is called the Wood Ant, its nest being generally found in woods.

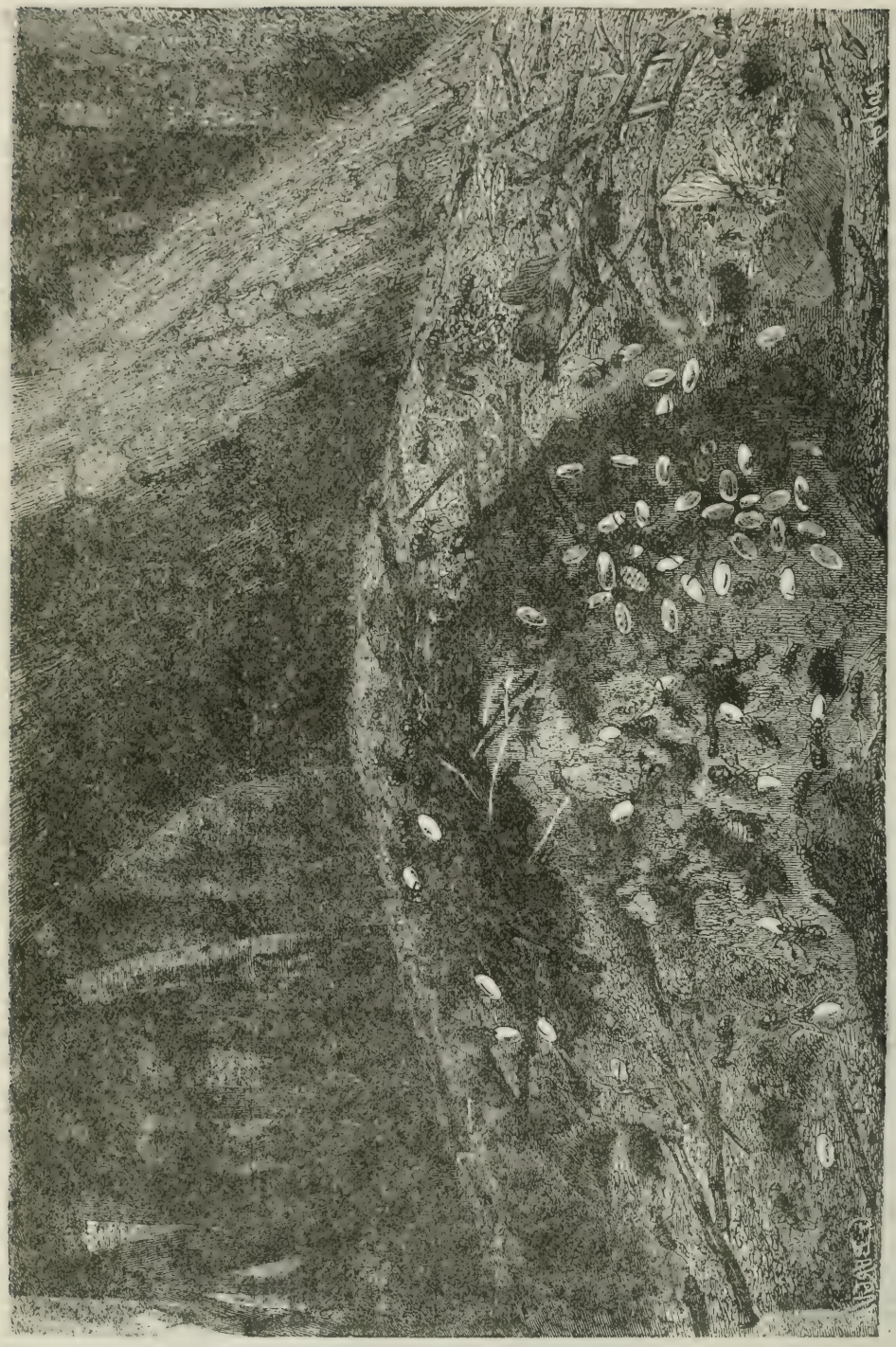


Fig. 24. The Wood Ant, *Formica rufa*.

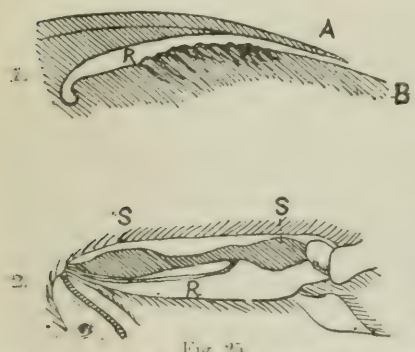


Fig. 25.
1. Abdomen of F. *flava* showing ridges (R) betwee 2nd and 3rd segments (A and B).
2. Tibia of *F. flava*, showing enlarged trachea (S S), return tube (R) (From Lubbock).

F. flava (Fabr). This species establishes its nest at the sides of roads, in fields, raising a small mound by its labours. It is about $\frac{1}{3}$ of an inch in length, or about the same size as the two species preceding.

Myrmica, the second genus, has two "knots" in the peduncle of the abdomen, while Formica has only one. These genera can be easily distinguished by this difference, which is shown in fig. 25. M. incompleta, (Provancher). A species about $\frac{1}{4}$ of an inch long, bright red and black. Very common under stones, particularly in sandy localities. Perhaps this is the *dimidiata* of Say. M. tuberum, (Fabr). Light red and dull black in colour, and about $\frac{1}{5}$ of an inch long. A rare species (in the Province of Quebec), found under the bark of trees.

M. molesta, (Say). A very small ant, only $\frac{1}{20}$ of an inch long, and pale yellow. This is the ant sometimes so troublesome in houses. It hides in the crevices of the plastering, etc., in the daytime, and at night swarms in the cupboards or wherever food is left. M. Provancher says he has never met with it, except in houses, which leads him to believe that it is not indigenous, at least in the Province of Quebec.

The ants of the genus Formica do not sting, while those of Myrmica, both females and workers, are furnished with that weapon. All, however, can use their mandibles for biting purposes.

A curious practice of the *habitans* in the Province of Quebec is mentioned by M. Provancher in the *Naturaliste Canadien*. He states that in felling trees, particularly in winter, the woodcutters often find numbers of the benumbed ants in the cavities of the bark, which they eat as delicacies. "We, ourselves," he says, "have seen ants eaten with avidity. Passing through Somerset in November, 1876, we remarked several children digging among the roots of an old stump. We approached them, and found that they were picking out ants from the bark of the roots and eating them, disputing as to who should have the largest share. It was our black ant, *Formica Pennsylvanica*."

SAW-FLIES.

(*Tenthredinidæ*.)

BY W. HAGUE HARRINGTON, OTTAWA.

The insects to be briefly described in this paper belong to the division known to entomologists as the *Hymenoptera*, which order contains all forms having four transparent, membraneous wings. To give a clear conception of the appearance of typical hymenoptera to those unfamiliar with the different orders of insects, it will only be necessary to mention the honey-bee. The habits of this familiar insect have been more frequently and more fully investigated than those of any other, and it is endeared to us all by the sweet spoils which it gathers; its remarkable industry in harvesting the dainty

NOTE.—In compiling this paper, I have drawn material from the Encyclopædia Britannica, Chambers' Encyclopædia, Nature, Science Gossip; Huber's "Fourmis Indigenes"; Provancher's "Naturaliste Canadien," and particularly from Lubbock's work. "Ants, Bees and Wasps, 1882."

An exceedingly interesting paper on Ants, by Rev. C. J. S. Bethune, is contained in the Annual Report for 1880. In it will be found much information on the subject, not contained in the present paper, including full directions for getting rid of them when they infest houses. It may be added that Mr. Bethune, owing to his onerous duties as Principal of the Trinity College School, Port Hope, has been compelled to relinquish his intention of continuing his papers, on these interesting insects, in the Reports—a result which we feel sure our readers will hear of with great regret.

secretions of flowers having been so directed and controlled by man as to obtain the best results for himself. The habits of many ants, wasps, ichneumon-flies and other hymenoptera have been also studied, but there remain vast numbers of which little or nothing is known, and which afford scope for the observations of all who seek to add to our knowledge of insect life.

Hymenoptera are divided into two sub-orders, named respectively Aculeata, or stingers, and Terebrantia, or borers. The first contains the bees, wasps, ants and other insects which have the abdomen (in the females) furnished with a sting to which an irritating poison is applied by special glands. The second contains forms in which the abdominal instrument is so constructed as to be used in sawing slits or boring holes in which the insect may deposit its eggs. It may be conveniently divided into three sections, namely: Entomophaga, or insect-eaters, such as the ichneumon-flies; Gallicola, or gallformers, consisting of a single family called Cynipidæ; and Phytophaga, or plant-eaters, containing the saw-flies and horn-tails.

The Phytophaga, being plant-eaters and consequently destructive and obnoxious insects, are of more immediate interest to agriculturists than the other sections. They are divided into two families, Uroceridæ and Tenthredinidæ. The former contains a limited number of species, usually of large size, of which the females are provided with a long augur-like borer for inserting their eggs deeply into the wood of the trees in which the larvæ feed when hatched.

The Tenthredinidæ, or second family, is that of which the remainder of this paper will treat. It includes the insects popularly known as saw-flies, of which certain species are well-known to every one who has attempted agriculture on even the smallest scale.

Saw-flies have none of the interesting social, or architectural habits of bees, wasps and ants, and, although highly organized in many points of structure, rank as the lowest of the hymenoptera. They are most obnoxious insects from the gardener's point of view, because they are all, as larvæ, strictly vegetarians, and what the farmer must perforce admire in his customers is, as regards insects, a most undesirable habit. In size they vary from the formidable cimbex, an inch in length, and with a wing expanse of more than two inches, to species no larger than a grain of rice.

The perfect, or winged, insect differs from the honey-bee in form, chiefly through having the abdomen sessile, or joined solidly to the thorax, instead of having the waist constricted so as to almost cut the insect in two. The head is of medium size, generally broad in front so that the large eyes are widely separated. On the top of the head are three ocelli, or single eyes, arranged in a triangle. The mouth is furnished with toothed mandibles, or jaws, which, in the larger species are quite dangerous looking instruments, although in reality they are quite harmless. The thorax is generally wider than the head, and bears, as in all insects, the organs of locomotion. It is formed of a large number of chitinous or horny plates, all of which have special names, and are of value in technical descriptions, but which need not be here enumerated. The legs are of moderate length, and slender in the majority of species. The wings, four in number, are large and membraneous, having comparatively few veins, and being generally transparent. The venation, or arrangement, of the ribs or skeleton, which supports the membranes of the wings, especially the front ones, is of importance as being principally used in the division of the species into genera. The anterior margin (of the front wing) is strengthened by a vein, which expands towards the tip into what is known as the stigma. Behind this are from one to three marginal cells, and behind these three or four sub-marginal ones. The abdomen is sub-cylindrical in form, and, as above stated, is not constricted at its junction with the thorax. It is composed of several distinct segments, the last of which in the female carry in a groove beneath them the characteristic ovipositor. This instrument consists of several pieces, but may be briefly described as a pair of horny saw-like plates enclosed in a pair of outer sheaths.

It is from the possession of these minute saws that the insects have received the popular and, as is frequently not the case in popular nomenclature, appropriate name of "Saw-flies." With this complex ovipositor the female saws slits in the stems or leaves of plants, in order that she may deposit therein her eggs. In some species, however, as in the imported currant saw-fly, the apparatus is so feeble, or aborted, that the insect has to

content herself with merely attaching the eggs to the plants in the same way as insects which are not equipped for carpentering.

From the eggs so carefully and laboriously deposited there hatch elongated, cylindrical larvæ, often resembling very closely those of lepidoptera, and for that reason known as "false-caterpillars." There are, however, structural differences by which they may be readily distinguished from the larvæ of moths and butterflies. The most noticeable of these is the relative number of abdominal or prolegs. No caterpillar has more than five pairs of these, whereas the saw-fly worms have from six to eight pairs, except in the peculiar genus Lyda, the larvæ of which are destitute of them.

The habits of saw-fly larvæ also resemble those of the true caterpillars—many species feed openly upon the foliage of plants, in large family groups, or singly, while others seclude themselves in galls, produced either by themselves or by other species of insects. When fully grown, the majority of species spin a silken cocoon, of greater or less compactness, within which to pupate. This cocoon is at times affixed to the food plant or to adjacent objects, but is more commonly found beneath the leaves and rubbish on the ground, or buried at varying depths beneath its surface. Many species do not spin a cocoon, but instead burrow in the ground and construct earthen cells in which to undergo the customary transformations. The duration of the several stages of life naturally varies with different genera and species: some are only single-brooded, while others produce two, three or more broods annually, and thus multiply so rapidly as to become, under favourable conditions, exceedingly abundant and destructive.

Having thus, rapidly and imperfectly, outlined the appearance and habits of the insects belonging to the family Tenthredinidæ, I will proceed to consider the several groups into which, for convenience of study, it is divided, and will give brief descriptions and life-histories of some of the better-known species. Although the family has been but meagrely studied in Canada, the species are so numerous that fully two hundred are recorded. The record is, however, as regards a large proportion of them, unfortunately confined to the mere capture of specimens, and an immense amount of work must yet be done before the complete life-history of each species can be given, while many additional species, doubtless, remain to be discovered.

Sub-families, six in number, have been formed, which are characterized chiefly by the number of articulations, or joints, of the antennæ. These are again divided into groups according to the number of marginal and sub-marginal cells, while minor differences of structure are made use of in distinguishing the genera which compose the respective groups.

Sub-Family 1.—Cimbicinæ.

The species included herein have short club-shaped antennæ consisting of from five to eight segments, and include our largest and most formidable representatives of the Tenthredinidæ. Of these the list is headed by *Cimbex americana*, which varies in length from three-fourths of an inch to one inch, and from one and three-fourth to two and one-fourth inches in the expanse of its wings. The sexes differ greatly in appearance, the male having the abdomen more elongated and flatter beneath. His legs, especially the four posterior ones, are enormously developed, and, with his long, toothed mandibles, make him a ferocious looking insect, as with strong, noisy flight he circles about in search of his mate. There are several distinct varieties of this species, separated by the colour and markings of the abdomen, and the relative clearness of the wings. The clear-winged varieties prevail in Canada; but even in these the margin of the wing is cloudy, as is also a spot beneath the stigma. In the typical form of the species the male is black, the head and thorax having a bluish, and the abdomen a purplish tinge. The female is black with a yellowish spot on the sides of the third, fourth and fifth segments of the abdomen. Both sexes have yellow feet and antennæ, the latter having seven joints, the last three forming a knob. The larva feeds chiefly upon the elm, but frequents also other trees, as willow and linden. It is of a pale yellowish colour, with a black stripe running down the back, and black dots along the sides. It is solitary in its habits, and when at rest upon a leaf, is coiled up like a snail-shell. When disturbed, it discharges a fluid secretion

from pores along the side, which probably serves as a defence against many of its enemies. In the latter part of summer it is full-grown (measuring an inch and a half or more in length) and spins a strong brown oval cocoon, either in the leaves, with which it falls to the ground, or on the surface of the earth under leaves, etc. It does not transform to a pupa until the following spring, and the winged insect appears in June and July. Though the larvæ of this species are large and voracious, they are never so numerous as to become very destructive to foliage.

Trichiosoma triangulum is a northern species, somewhat similar in appearance to the preceding, but smaller, being about three-fifths of an inch long. The head and thorax are black, the latter clothed with long whitish hairs. The thighs are bluish-black (the four posterior ones of the male having a sharp tooth underneath) and the remainder of the legs yellow. The antennæ are eight-jointed, the base and club being dark, and the intervening joints yellow. The wings have a strong yellowish tinge. This insect is rare throughout Ontario, but appears to be more plentiful west and north. Mr. Geo. W. Taylor records it (Canadian Entomologist, vol. xvi, page 91) as tolerably common in British Columbia. The larva is said to have the same habits and to undergo the same changes as that of Cimbex.

Abia Kennicotti is a smaller and somewhat bee-shaped insect about one-third of an inch long. Its colour is black varied with blue and green; the legs whitish and wings yellowish. I am not acquainted with its habits. Two closely allied species, not yet recorded from Canada, although probably inhabiting it, are *Abia caprifolia* and *Abia cerasi*, which, as their names indicate, feed upon the honeysuckle and cherry respectively. The larva of the former is described as yellow, with the back greenish, and with rows of black spots. It spins a compact cocoon half an inch long, in which it undergoes its changes in the manner of that of the Cimbex.

The last species of this sub-family which I will mention is a diminutive black fly (only about one-eighth of an inch long) which I have frequently found on hickory (*Carya amara*). It is *Acordulecera dorsalis*, and has short six-jointed antennæ, the last joint rounded, but not enlarged so as to form a club or knob. The body is short and stout; black, with minute whitish hairs; the feet are also whitish. I have taken these saw-flies upon the hickory leaves about the first of June, and again about the first of August. Larvæ, which are perhaps those of these flies, do considerable damage to the hickory, especially the smaller trees, as they feed together in a row across the leaf and devour everything but the mid-rib. They are pale green, whitish below, about one-third of an inch long, and when full grown they descend to the ground and form therein white shell-like cocoons about the size of a grain of rice, from which so far I have been unable to obtain the winged insects.

Sub-Family 2.—Hylotominæ.

The species of this group are not numerous, and are distinguished by the antennæ having only three or four joints, of which the third is very much longer than the others. Two genera are represented in Canada; the first—Schizocerus—by a single species which I have not seen, the second—Hylotoma—by four. Of these I have collected three species in this vicinity, and have received the fourth from Mr. Fletcher, who captured it at Dalhousie, N.B. They are rather handsome insects, about one-third of an inch long, but are neither sufficiently numerous nor injurious to call for detailed descriptions. They are easily distinguished from our other saw-flies by their three-jointed antennæ, of which the third is very much elongated and in the males furnished with rows of hairs.

Sub-Family 3.—Tenthredininæ.

The species herein contained are of small or moderate size, and the number of articulations in the antennæ varies from nine to fifteen. The sub-family contains at least nine-tenths of our saw-flies, and nearly all the well-known destructive species.

At the head of it stands *Cladius isomera*, which is a small shining black fly, with whitish feet and clouded wings; length less than one-quarter inch. The larvæ feed in large numbers upon the willow, and devour the leaves with the exception of the skeleton.

They are about two-fifths of an inch long, and are of a pale, yellowish colour, with the back greenish. The head and last segment are black, and there is on each side a row of black spots, eleven in number. Upon the back and on each side are two rows of small tubercles, bearing long, white hairs. Specimens which I collected on 26th June, spun (between 1st and 3rd July) transparent yellowish cocoons of light texture, which were attached to leaves in the breeding-jar, and in which the larvæ could be plainly seen. A few days later they transformed to pupæ, and the winged insects appeared on 19th to 24th July, or a month after the larvæ were full grown.

The genus Pristophora contains several species, of which *P. grossulariæ* is known as our native currant saw-fly. It has been figured and described in one of our early reports, as well as by Mr. Saunders in his "Insects Injurious to Fruit," in which useful and beautiful book several other saw-flies are also treated of. It is never so abundant or injurious as the imported currant-worm (*Nematus ventricosus*) hereafter to be mentioned, nor is it so large an insect. The larvæ, shown at Fig. 26, *a*, are of a pale green colour, without black spots, and are scattered over the bush when feeding. Although generally few in number and doing comparatively slight injury, they have been found at times so numerous in some places as to entirely strip the plants, gooseberry or currant, on which they fed. The flies (Fig. 26, *b*,) are black, with yellowish markings. A closely allied species found in the United States, is the Cranberry Saw-fly (*Pristophora identidem*), which sometimes commits serious injuries in the cranberry marshes of Cape Cod.

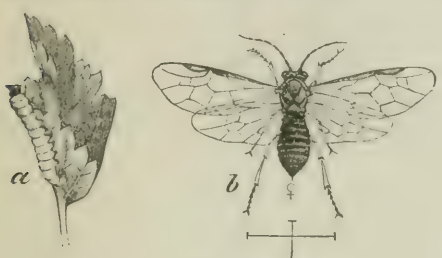


Fig. 26.

The genus Euura contains small species, of which the larvæ form galls on willows, or inhabit galls formed thereon by other insects. *Euura orbitalis*, the only species apparently recorded from Canada, is one of the former. It is a shining black species, one-eighth of an inch long, with pale head and legs. The larvæ, of a greenish-white colour, feed in the lateral buds of the willow twigs, causing them to become much enlarged, and eating the increased growth internally so as to leave but a mere shell, from which they bore out, and descending to the ground spin a thin whitish cocoon.

The genus Cræsus contains a single species (*C. latitarsus*) of which the larvæ are known to feed upon wild cherry and birch. The perfect insect is one-third of an inch long: the body shining blue-black, legs and antennæ black, wings hyaline.

Nematus is a very extensive genus containing small or medium-sized species, the operations of which are often extremely destructive.

Nematus ventricosus, introduced from Europe, is so familiar to everyone, and has been so frequently mentioned in previous reports that, were it not such an important species, it would not merit further description. My remarks on it will, therefore, be as brief as possible, giving merely the leading facts. The winged insects are from two-tenths to three-tenths of an inch long, the male, as is usually the case, being the smaller, and the ample wings expand about one-half of an inch. The sexes differ in colouring, the female (Fig. 27, *b*,) having the brightest dress. She is mostly yellow, but her head is black, her antennæ brown-black, and her thorax more or less spotted and striped with black. The male (Fig. 27, *a*,) has the head, antennæ, thorax, and most of the upper surface of the abdomen black, the lower side being yellow. The females which appear in early spring deposit their eggs in rows upon the under surface of the leaves (Fig. 28), and from these hatch, in about ten days, the worms which so speedily destroy the young foliage. At first a number are found upon

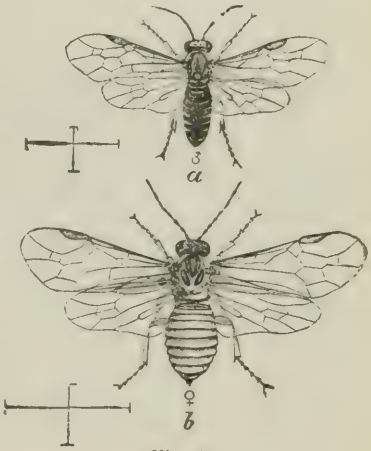


Fig. 27.

each leaf attacked, eating small holes through its substance, and gradually devouring all but the skeleton. Then forced to seek new feeding grounds they separate more and more as size and appetite increase, until often the whole bush is visited and defoliated. The

Fig. 28.

Fig. 29.

larvæ (Fig. 29) are whitish when hatched, but soon become green, and then develop numerous black spots, and have the extremities tinged with yellow. When full-grown they descend to the ground and spin oval, smooth, tough, brownish cocoons, either under leaves and rubbish or in the ground: occasionally they are found attached to the stems and leaves of the bushes. The flies emerge generally about the first of July, and the second brood of worms attain their full growth toward the close of summer, and winter in their cocoons. Hellebore has been proved to be the most convenient and efficient remedy for the removal of the worms. It is applied in the proportion of an ounce to a pail of water, thoroughly mixed, and freely sprinkled over the plants; care being taken to watch for the successive broods.

Fig. 30.

Nematus Erichsonii is a saw-fly which has recently been found committing immense ravages upon the larch (commonly known as tamarac, hackmatack, juniper, etc.) in the Provinces of Quebec and New Brunswick, as well as in portions of the United States. It is about the size of the preceding species; the head, antennæ, thorax and tip of abdomen are black; the legs, except hind feet, and five segments of abdomen are rufous. The larvæ devour the leaves rapidly, and when numerous a tree is speedily stripped. They spin cocoons very similar to those of the ventricosus.*

Nematus Similaris is a smaller species, of which the worms feed upon the leaves of the locust. The fly (Fig. 30, *f*) is about one-fourth of an inch long; yellowish, with a patch on top of head; the sides and front of the thorax and bands on the abdomen, black. The egg (Fig. 30, *a*) is laid in a slit made on the under surface of the leaf (as are those of many other species) and the worm (Fig. 30, *b*, *c*), when hatched,

*A special paper on this species is being prepared by Mr. Fletcher, who has studied its extensive ravages, so that a more complete account of it is unnecessary here.

commences its ravages by eating the margin of the leaf or a hole therein. It is pale green, with a brownish head, and is about half an inch long when full grown. The cocoon (Fig. 30, *e*) which it spins is oval, and dark brown. There are at least two broods, as I have observed the young larvæ feeding (as represented at 30, *b*) in June and older ones in October, and have captured the imago at the end of August. Last October I found larvæ, nearly full-grown, feeding on my trees as late as 12th or 13th, which were probably killed (if they had not descended to spin up) by the sharp frost which occurred on the night of the 14th, as upon my return from attending the annual meeting of the Entomological Society (held in London on 15th), I found the foliage shrivelled and black, and no signs of the worms. They are not abundant enough here to do much harm; nor am I aware that injuries by them have been recorded in the Province.

Several species of Nematus form galls on willows, such as *N. salix-pomum* and *N. salix-pisum*. The first, about one-fifth of an inch long, is yellow with black markings, and the larva inhabits a globular, smooth, fleshy gall, which develops under its influence on the side of the midrib of the leaf of *Salix cordata*. The second is an insect of the same size, producing on the under surface of the leaves of *Salix discolor* galls which are yellowish, hollow and subspherical.

The genus Emphytus contains several species, of which one—*E. maculatus*—is a well-known enemy to the strawberry plant. The eggs (Fig. 31, *9*) are placed early in spring in slits sawed in the stems, and a fortnight afterwards the larvæ (Fig. 31, *4* and *6*) are found commencing to riddle the foliage. They are pale greenish above, and pale yellowish beneath, and when mature are about three-fifths of an inch long. The cocoons (Fig. 31, *7*) are formed under ground of particles of earth, and the flies emerge early in July. In August a second brood of larvæ appears, which pass the winter in their earthen cells. The winged insect (Fig. 31, *3*) is black with whitish bands (interrupted so as to form two rows of spots, whence the specific name) on the upper surface of the abdomen.

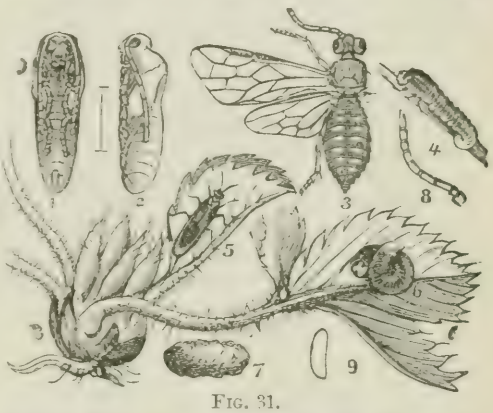


Fig. 31.

We now reach the genus Selandria, which is perhaps even more destructive than Nematus, and of which nearly twenty species are known to occur in Canada. They are small insects of inconspicuous colouring, much like some species of the preceding genus, but are distinguished from them by the wings having two marginal cells instead of one. I will have space here only to mention a few of the more injurious species, and these but very briefly.

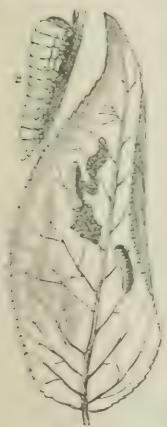


Fig. 32.

Selandria cerasi, as its name indicates, is found upon the cherry, but feeds also upon the pear and occasionally on other trees. The larvæ are slug-like worms, covered, as are several other species of the genus, with a viscid slimy substance exuded from the skin, probably as a protection. They are tapering in form, being largest just behind the head, are brownish in colour, and are disagreeable in appearance, owing to their slimy coating. After the last moult, they have a clear yellow skin, and are not covered with slime. Descending into the ground from one to four inches, they construct little earthen cells smooth within. Eggs are laid in the leaves about the first of June by the flies produced from the worms of the previous year, and hatch in about two weeks. The larvæ (Fig. 32) attain their growth in about a month, and the flies (Fig. 33) issue about the end of July. A second brood of larvæ are to be found feeding in August, the flies from which emerge the following spring. The winged insects are of a glossy black colour; the legs below the knees are whitish, and the front wings with a large clouded spot in the middle.

Fig. 33.

Fig. 34.

Another very injurious and abundant species is *Selandria rubi*, the larvæ of which destroy the foliage of both wild and cultivated raspberries. They are not slimy like those of the foregoing species, but bear whorls of white spines in rows upon the back and sides. (See figure 34.) The leaves are pierced with small holes by the young worms, and as these increase in size the holes become larger and more conspicuous. The period of growth and manner of transformation are as in the preceding species, but there appears to be only one brood, the flies not appearing until the following spring. The larvæ appeared to be unusually abundant last season. The flies, an example of which is shown in figure 35, magnified, have a black head and thorax, and reddish or yellowish abdomen and legs.

Selandria rosæ produces a slug which feeds voraciously at night upon the upper surface of the leaves of roses. It lives about a fortnight and is of a dull yellowish colour, and not slimy. A cell is constructed in the ground and the slug does not pupate until the following spring, there being only one brood. The small blackish flies emerge from the ground when the roses are in leaf, and deposit their eggs in slits sawed in the margin of the leaves.

Fig. 35.

The grape-grower is sometimes much annoyed by the larvæ of *Selandria vitis*, which is a blackish fly having the thorax red above, and the legs below the knees whitish. The worms, when full-grown, are half an inch long, and are yellowish with transverse rows of black spots. Feeding side by side in rows of from five to twenty, they speedily devour a leaf and seek

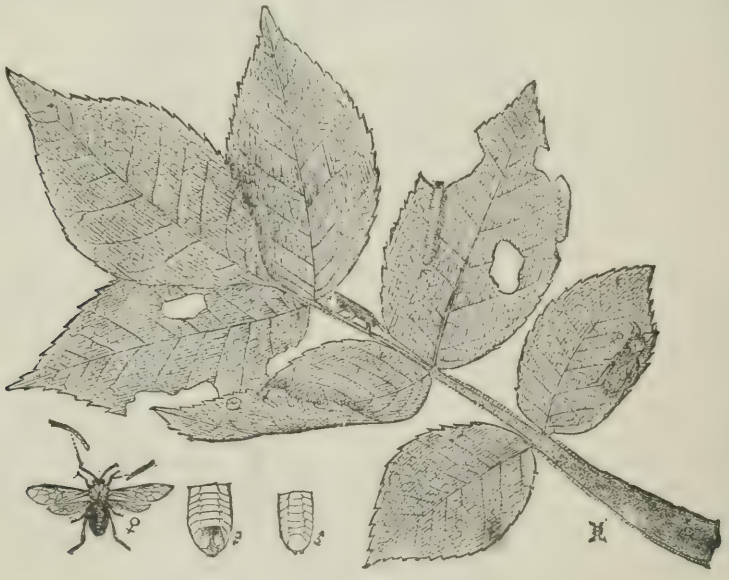


Fig. 36.

a new one. Cells are formed in the earth by the mature larvæ, and the flies from the first brood issue about the first of August; those of the second not until the following spring.

Selandria barda is a saw-fly differing from the former in begin entirely black, with the exception of the red portions of the thorax, and in having the upper wings darker. It has been recently recorded * as infesting ash trees in Iowa, and we may safely expect that its habits will be the same here. (Figure 36 from Mr. Osborn's report illustrates this insect in its several stages.) The eggs are laid in the leaf-stem and produce, in two or three days, whitish worms, having black heads and feet. As the worms grow older they become of a clear green colour, retaining their jet-black heads and thoracic legs. I have only captured one specimen of this saw-fly myself, but it may be more abundant in other parts of the Province.

The larvæ of *Selandria caryæ*, which feed in the United States upon butternut and hickory, are remarkable from the dense covering of a white floculent substance which they secrete, and which gives them the appearance of little masses of cottony wool.

Macrophya is an extensive genus containing larger and handsomer species than the foregoing, but their habits are apparently less obnoxious, and not so well recorded. *M. niger*, as the name indicates, is black, but the tips of the antennæ are white. *M. flavicoxæ* is another black species, having the legs handsomely banded with white.

The genus Allantus contains species very similar in general appearance, but having shorter and thicker antennæ. *A. basillaris* is very abundant in July and August on the flowers of Spiræa and Solidago. It is a handsome fly, half an inch long, and black, with liberal markings of yellow, and has quite a wasp-like look.

The last, and typical genus of the sub-family, is Tenthredo, which contains more than thirty Canadian species, some of considerable size and beauty. *T. rufipes* (*Allantus leucostoma* of Kirby's Fauna Bor. Am.) appears to be the commonest species here. It is half an inch long; black with reddish legs, of which the hinder pair are partly black. *T. atrovioluceа* is of the same size and colour, but the legs are dark and the wings violaceous or cloudy, instead of transparent. *T. grandis*, *T. tricolor*, and *T. mellina* are also large handsome species. Of the larvæ of these interesting species I am, however, unfortunately ignorant, probably they are not very injurious as the winged insects do not appear to be abundant

Sub-Family 4.—Lydinæ.

The members of this family are distinguished by their multi-articulate antennæ, which usually have from fifteen to thirty-six joints, and vary much in shape, being short or long, simple, serrate or pectinate. The larvæ feed upon evergreens. Only two genera, Lophyrus and Lyda occur in Canada; each contains several species.

Lophyrus abietis is a robust fly about one quarter of an inch long, and with large transparent wings expanding more than half an inch. The antennæ are short; those of the females being stout, serrated, and containing eighteen joints; those of the male are broadly pectinate and cause him to appear very different from his mate. In colour also the sexes differ, the male being black and the female yellowish or ferrugineous. The worms, when young, are brownish, but subsequently become of almost the same shade of green as the leaves on which they feed (those of fir and spruce) and upon which it is, therefore, difficult to see them. The head is pale, and there is a white stripe along each side. The flies are said to emerge in May, and produce larvæ which feed in July and August and there may, perhaps, be two broods. I found both young and mature larvæ feeding together on 23rd August last, and the winged insects were also captured on the same day upon the trees (spruce). The full-grown larvæ spun their cocoons two or three days later, from which the flies will issue next spring.

Lophyrus Abbotii is a slightly larger saw-fly, very similar in appearance, the larvæ of which are often found abundant on the white pine (*Pinus strobus*) greedily devouring the foliage, to the injury and even destruction of the trees. (In Fig. 37 the insect is

* Mr. Henry Osborn in Bulletin of the Iowa Agricultural College, reprinted in Aug. number of Can. Ent. Vol. xvi., p. 148.

shown in all its stages.) The larvæ are, when full grown, from three-fourths of an inch to one inch in length, and are soft whitish worms with rows of squarish black spots along the back. (Fig. 35, 4.) When disturbed they throw back their heads and jerk themselves about as shown in the figure. Like those of the preceding species they may be found upon the trees during July, and spin dark compact cocoons from which the flies do not issue until the following summer. I have recorded (Ott. Field-Nat. Club Trans. No. 4, page 76) the presence in destructive abundance of the larvæ of this or an allied species upon the red-pine (*Pinus resinosa*) in this vicinity in 1881. Unfortunately the observations necessary to identify the species were not made at the time, and I have since been unable to discover the insects upon these trees. There are other species of Lophyrus, known to prey upon the pines, but I have not been able to find any mention of their occurrence in Canada.*

Fig. 37.

The genus Lyda contains larger species which are wider and more fattened, and which have long, slender antennæ. The larvæ also differ from those of all other saw-flies in having no abdominal feet, and in having three-jointed antennæ, and a pair of appendages of similar form on the anal (last) segment, which is covered above by a hard horse-shoe shaped plate. I have captured four or five species of these saw-flies on white pine, the most abundant being *L. maculiventris*, which appears in June and July. Larvæ, some of which are probably those of the species just mentioned, may be found late in the season feeding singly, or two or three together, in the clusters of leaves which they bind loosely together with silk which they are able to secrete, freely and rapidly. Last August, I collected specimens belonging evidently to two species, but owing to an accident they all perished, and further study will be needed to determine the question.

Sub-Family 5. Cephinæ.

The species, few in number, which belong to this sub-family, have the neck elongated, the antennæ multi-articulate, 21-28 jointed, and the wings with two marginal and four sub-marginal cells. Of their habits but little is known; the larvæ probably feed in the new wood of different trees and shrubs. Three species belonging to the genus Phyllæcus are recorded from Canada, but they are rare and I have never met with any specimens.

Sub-Family 6, Xyelinæ.

These insects have the ovipositor exserted and nearly as long as the abdomen. The antennæ are about thirteen-jointed, the third joint being greatly elongated. There appears to be but one Canadian species, *Xyela minor*, a small blackish insect about one-tenth of an inch long with twelve-jointed antennæ.

THE LARCH SAW-FLY—*Nematus Erichsonii* (Hartig).

BY JAMES FLETCHER, OTTAWA.

During the last year or two, a new and formidable insect-enemy to our forest trees has appeared in Canada, in the shape of the larch saw-fly, *Nematus Erichsonii*. The first notice of this saw-fly as an American species was, I think, Dr. Hagen's short note pub-

* The genus is omitted from the Check List of the Toronto Natural History Society, and Abbé Provancher, in his admirable work (Petite Faune Entomologique du Canada, Vol. II., p. 228), states that he had never met with specimens.

lished in the *Canadian Entomologist* for 1881 (Vol. XIII, p. 37), on some larvæ collected in 1880, by Prof. Sargent of the United States Census, Forestry Division, from European larch trees growing in the neighbourhood of Brookline, Mass. The first notice of its occurrence in Canada was the announcement made at the annual meeting of the Entomological Society of Ontario for 1883, by the Rev. T. W. Fyles, of South Quebec, to the effect that much injury had been done during 1882 and 1883 to the tamarac trees (*Larix Americana*) in the eastern townships, particularly in the townships of Bury and Fingwick, by a species of saw-fly, which he thought was probably the same as that which had caused so much injury in Maine and the other Eastern States, *Nematus Erichsonii*. Mr. Fyles was at that time living at Quebec, and from the fact that he did not mention having found the species in that locality it may be inferred that it had not reached there then. In the Quebec *Morning Chronicle* of the 16th July last, however, Mr. Fyles publishes a letter in which he states that the tamarac trees at Beauport, near Quebec, had been nearly stripped of their foliage by the larvæ of this insect, and in travelling from Ottawa to the Lower Provinces, in the month of July, I observed almost all along the line of railway that an enormous amount of damage had been done to the tamarac trees. For miles not a tree of this species could be seen that did not bear umistakable signs of their presence. At first, not knowing the appearance of the trees after they had been defoliated by these larvæ, I supposed that the brown appearance had been caused by forest fires, which are by far too frequent in Canada; but after a time a clump of trees occurred close to the railway and I was able to detect the true cause of the injury. The trees about Quebec seem to have suffered most severely, and from this point, proceeding east and west, the ravages appear to diminish. In the Eastern Townships I found the tamaracs badly injured. Through the kindness of S. A. Fisher Esq., M.P., I was enabled to examine some trees near Brome, P.Q., which were almost defoliated by these worms. The tops of the large trees and all young trees which stood alone, away from the edge of the swamp, were entirely bare, on many of them there was not a green needle to be seen. I think it is hardly probable that these trees will be able to survive, for they did not throw out any later leaves towards the end of the summer. Among the trees destroyed this year were some small dead trees which had presumably been killed the previous season, for the terminal shoots of the branchlets were twisted and distorted in the manner peculiar to the attack of this pest. Some interesting specimens of twigs were sent to me from Quebec, by the Rev. Mr. Fyles, in the month of October, in which the tree had succeeded in pushing out the leaves which had been eaten down by the *Nematus* in July, to the distance of about a quarter of an inch. It is just possible that the trees may survive the attack, unless it is again repeated next season, for these leaves, although insufficient to perform the full functions of the foliage to the plant, may yet have stored up enough food to support the tree until the next season, when the marauding army having passed on to more abundant feeding grounds, will allow the weakened trees to regain their vigor, the very severity of the attack working a partial remedy. The instinct of the parent fly will prevent it laying its eggs where there is an insufficient food supply to carry the progeny to maturity. The most western point so far recorded for this insect is Alexandria, on the Canada Atlantic Railway—miles from Ottawa, this, too, is the nearest point to Ottawa where I have observed the injury to be sufficiently great to attract attention. At Casselman, 30 miles from Ottawa, by searching closely I found a few twigs which had been punctured by the female for the reception of the eggs; and at Ottawa itself, one twig was found distorted in the characteristic manner. From these facts, and the remarkable rapidity with which this destructive insect has spread over the continent during the past four years, I fear that by next year the tender green foliage of the larches in this locality will be destroyed, and the trees rendered as unsightly as they were in Quebec and New Brunswick last year.

Below Quebec, along the Intercolonial Railway, particularly about Chaudière Junction, by the middle of July, there was not a leaf to be seen on the tamarac trees. Soon after leaving Chaudière Junction the country is open and there are no trees to be seen for a long distance. It was not until the Province of New Brunswick was entered that I again had a chance to notice the ravages of this insect. During a short visit to Dalhousie, N.B., I had a good eportunity of observing the work and life-histories of these larvæ closely. The first evidence that I saw of the presence of the insect was a row of

young European larches which had been planted in a garden in the middle of the town, and which were entirely stripped of their leaves. Upon enquiring if there were any larch or tamarac trees in the neighbourhood, I found that these names were not even known, and when I explained that the tree I was in search of was a Conifer which dropped its leaves in winter, I was informed that "Juniper" was what I meant and should have asked for. This tree does not appear to be so plentiful in the Lower Provinces as in Quebec and Ontario; but wherever they were detected I found more or less of the larvæ of the saw-fly also. At the mouth of Eel River, a mile or two from Dalhousie, is an extensive tamarac and cedar swamp, and here I found that although some of the trees were untouched; yet the greater proportion, especially the taller trees, were badly infested.

On the farm of Mr. Duncan Stewart, there was a row of tamaracs which he has transplanted from the swamp mentioned, and these were badly infested, being conveniently near to the McHarran Hotel, where I was staying, I was able to examine the insects frequently, between the 16th and the 28th July. On visiting the trees the first time, I succeeded in capturing two perfect females of the saw-fly, and found a large number of the clusters of the young larvæ. They were evidently much later in hatching out in this locality than at Quebec, as at this time little harm had been done, and although there were larvæ of all sizes, by far the greater part were very lately hatched from the eggs—and were collected in clusters, every needle of each fascicle, near the part of the twig which had held the eggs, bearing its strange-looking dark-green larvæ. Immediately after hatching, the young larvæ attack the leaves nearest the orifices of their cells; they do not consume the whole of the leaves but nibble the edges, leaving them ragged and uneven. They seem always to work backwards, down the branchlet, and leave the terminal shoot untouched. After the first month they are very voracious and consume every needle in the different fascicles as they come to them; beginning at the apex and holding them between their thoracic feet, they eat them right down to the base, and as soon as one bunch of leaves is finished they move back to the next. On being disturbed they curl their bodies over their backs similarly with the larvæ of some other species of saw-flies. They may, too, be seen sometimes resting in the same position, when being in large numbers all together, they have a very peculiar appearance. When the young larva is first hatched the head is disproportionately large and of a darker colour than the body. I regret to say I did not take accurate measurements of the larvæ, nor record the duration of the different moults; but the active larvæ stage seemed, in most instances, to last about one week, although a few individuals I took home with me from the Eastern Townships, fed for the remarkably long period of three weeks before spinning their cocoons. It is probable that some of these will turn out to be parasitised. After the first moult the larva is of a lighter green in colour, and the head and thoracic feet are black instead of dusky green. After the next moult, however, a great change takes place; the worm is quite altered in appearance; it is very much larger and the colour is quite different; instead of dull-green the whole upper surface of the body is of a peculiar bluish-white hue, similar to the glaucous waxy bloom which is seen on some fruits or the leaves of some plants, as for instance the bloom of the ripe plums or the glaucous white colour beneath the leaves of Pines and the Common Juniper (Juniperus Vulgaris). The black head is very conspicuous, and on each of the segments, after those which bear the thoracic feet, except the last, are two double rows of small black tubercles; these do not occur on the second, third and fourth segments. After this there is one more moult; but the only important change is in the size of the larva which, when full-grown, is about an inch and a quarter in length, bluish-white above and green beneath, head and thoracic feet black; pro-legs, of which there are seven pairs, green. When mature and just before spinning up, the larvæ assume a brownish or pinkish hue, and drop from the trees to the ground, where they spin an oval cocoon about half an inch in length and of a dark-brown colour. The cocoon is generally found beneath moss or stones or among the roots of grasses, on or just beneath the surface of the ground; but Dr. Fyles writes me that he found the cocoons at least six inches beneath the surface along the bottom of a hot-bed where they were collected together in masses. Although the larvæ spin up about a week after emergence from the egg, they do not at once change to pupæ, but pass the

winter in the larval form, and it is not until the following spring that the pupal stage is attained. This is the case with most, if not all, the Tenthredinidæ which pass the winter in a cocoon.

The perfect insect is a handsome Saw-Fly, in general appearance, as to shape and size, somewhat resembling the well-known Gooseberry Saw-Fly (*Nematus centricosus*); but it is slightly larger and quite different in colour. The head and thorax, as well as the nine-jointed antennæ, are black, together with the base and tip of the abdomen; segments two to five and part of the upper and the whole of the lower surface of segment six, are of a rich waxy orange colour; the first and second pair of legs yellowish, the femora a little darker than the rest of the legs and slightly tipped with black above, and the third pair of legs is much longer than the others; the femora are a little darker, about the same colour as the abdomen, more decidedly tipped with black above; the tibiæ are light-yellow for two-thirds of their length, and from that spot to the ends of the legs the colour is black. In the other two pairs of legs the tarsi and claws are yellow like the rest of the leg. The wings are black-veined, with a tawny fore margin on costa; the dark spot towards the tip of the wing, known as the stigma, is black, and there are only three sub-costal cells in this species. The perfect insect is a handsome Saw-fly, the wing of the female expanding about three quarters of an inch, the antennæ are long, over half the length of the body, which latter measures about half an inch. Perfect insects emerge towards the end of June or in the beginning of July, the date varying according to the locality. The eggs are laid in the terminal young shoots of the tamarac, and sometimes in one of the lateral shoots as well. I was not fortunate enough to observe the process of oviposition, nor indeed to find the unhatched eggs; but in the last Annual Report of the Entomologist to the United States Department of Agriculture, Dr. Packard has published a most interesting report on this insect with a beautiful coloured plate. In this report he describes the manner in which the eggs are laid, as follows:

"The female saw-fly makes about a dozen incisions in the terminal young, fresh, green shoot, sometimes in one of the side shoots next to the terminal one; judging by the shape of the hole, the eggs are of the shape described by Ratzeburgh, *i.e.*, oval cylindrical, and about 1.5m.m. in length. The eggs are placed in two rows, alternating, not exactly parallel, one being placed a little in advance of the other. The eggs are inserted at the base of the fresh, soft, young, partly-developed leaves of the new shoots, which are usually by June 20th to 30th, only about an inch or an inch and a half in length. The presence of the eggs causes a deformation of the shoot, which curls over, the incisions being in all cases observed, on one (the inner) side of the shoot. * * * * After the foregoing lines were written, we fortunately observed a female in confinement, June 29th, while engaged in the process of ovipositing; we should judge that the operation of sawing the slit and depositing the egg required not less than five minutes, and perhaps not much more than that length of time. The fly had been evidently at work some time previous, as a number of eggs had been laid along the shoot; she had begun at the further end and worked down to the base of the new, fresh, green shoot. She stood head downward while engaged in making the puncture, and was not disturbed by our removing the larch twig from the glass jar and holding it in our hand while watching the movements of the ovipositor under a Tolles triplet. The two sets of serrated blades of the ovipositor were thrust obliquely into the shoot by a sawing movement; the lower set of blades was most active, sliding in and out alternately, the general motion being like that of a hand-saw. After the incision is sufficiently deep, the egg evidently passes through the inner blades of the ovipositor, forced out of the oviduct by an evident expulsive movement of the muscles at the base of the ovipositor. The slit or opening of the incision, after the egg has passed into it, is quite narrow and about $1\frac{2}{5}$ m.m. in length. While engaged in the process the antennæ are motionless; but immediately after the ovipositor is withdrawn, they begin to vibrate actively, the insect being then in search of a site for a fresh incision. * * * * Although the slit is at first closed, as soon as the embryo increases in size the twigs swell where they have been incised by the ovipositor, and the slits enlarge and gape more or less, becoming much larger and more conspicuous than when the eggs are first deposited."

"The egg is slender, cylindrical, tapering rapidly towards each end. Length, 1.2m.m."

There is apparently some slight uncertainty as to the identity of our American insect with the true *Nematus Erichsonii* of Europe. In the United States Bulletin, No. 3, issued by the Entomological Division of the Department of Agriculture in 1883, I notice that it is mentioned as "*Nematus Erichsonii.*" When the insect was first discovered, it was referred to Dr. Hagen, who pronounced it to be *N. Erichsonii*, and published the note above referred to in the *Canadian Entomologist.* The habits of the two forms do not seem to agree in every particular. In Dr. Packard's excellent report, he gives Ratzeburgh's description of the fly, which the latter author called the Large Larch Saw-fly, and further states that "our saw-fly differs slightly from the German, in the eggs being laid at the base of the leaves, on the newly-grown shoots, rather than on, or just under, the epidermis of the last year's shoots, where we have repeatedly, and in vain, searched for them." Ratzeburgh describes the eggs as "laid usually in a single row on the upper end of the young shoots, two or three sometimes being placed together along the shoot." In all instances that I have examined, the eggs were laid in a double row. The European insect is extremely rare, but Ratzeburgh thought that, from a forestry point of view, it might become injurious, since the larvæ had already, in certain seasons, abounded on the larches in sufficient numbers to attract the attention of the forestry officers in Holstein. Dr. Hagen records that twice before 1840 they had been observed to be very obnoxious to the larch in Holstein by Tischbein, and in the Horz by Saxesen.

However, the habits of the American and European forms are very similar, and Dr. Packard thinks it is very probable that the insect is common to both Europe and North-Eastern America. He further adds, "at any rate, our species could not have been introduced with European larches, since its ravages have been committed in the wilder and less frequented portions of Maine, New Hampshire, and New York, as well as on the seaboard in towns long settled." Notwithstanding the above, I cannot help thinking that the appearances are strongly suggestive of the insect being an introduced pest,—its rapid progress over the continent and its occurring in such vast numbers for four years successively, as well as its comparative freedom from parasites. Moreover, the first specimens were found on European larches, and wherever I have seen this tree planted in the infested districts, it seems to have been preferred by the insect to the native tree, and to have suffered first; and it would even appear that in the notable instance of the discovery of the *nematus*, the native tree was left alone while the introduced species suffered. In Prof. Sargent's letter, printed in Dr. Packard's report, he writes, "I have not heard of any injury to our native hackmatacs. Three or four years ago, however, I noticed that specimens of the European larch in this immediate neighbourhood were suffering from the attacks of a larva, which I gathered and submitted to Dr. Hagen.

It is important to notice, too, that although the insect had been there, it had passed on to some other locality; and from this we may hope that a similar occurrence may take place in Canada; and indeed I am informed by S. A. Fisher, Esq., that on the lawn of the Hon. J. J. C. Abbott, of St. Anne's, P.Q., a specimen European larch was, in the summer of 1883, severely attacked by some larva and almost defoliated; but that during the past season it had been well covered with foliage and was uninjured.

Should the attack of these injurious saw-flies continue unabated for but a very few years more, it will occasion a most serious loss to the Dominion. The Tamarac or Larch, known also as Hackmatac and locally as "Juniper," is one of the most valuable available woods for railway sleepers, and is also used for many other purposes, particularly in ship-building; and not only is the wood valuable intrinsically, but the tree has also a special and peculiar value, from the fact that it will grow in those extensive swampy tracts, so common in Canada, where few timber trees are able to exist.

It is to be hoped that before long some natural enemy will appear, to keep these insects in check, for it would be impossible to apply any artificial remedy with any hope of success, on account of the inaccessible nature of the bogs and swamps in which they breed. Already some parasites have been discovered; Dr. Packard has provisionally named a chalcid parasite *Pteromalus nematicidæ* which was found in some cocoons collected in Maine and at Brome in the Eastern Townships. I found the larvæ being

destroyed by a small hemipterous bug; I could only secure one specimen, which was in the larval stage; I kept this in a cage and fed it on the larvæ of *Nematus ventricosus*, and after a time it produced *Podisus modestus*. Two other species of insects were noticed by me harrassing them, but I could not secure specimens: a larger Hemipteron, and at Dalhousie a species of Ichneumon fly about half an inch long, black, with red legs. Where single trees are grown as specimens on lawns, or as ornamental trees by the sides of roads and streets, they may be protected by showering them with Hellebore or Paris-green, in liquid mixtures; or, where the clusters of young larvæ are within reach, a blow with a flat instrument as the blade of an oar or a paddle will knock them off the branch, and thus a whole family of larvæ may be despatched at one stroke. Two of the trees in the row I have mentioned, which were planted by Mr. Stewart at Dalhousie, were kept clean by this simple means, the young larvæ, evidently getting lost among the tall grass under the trees, were thus prevented from climbing up again and attacking the foliage.

(No. 91.)

Return shewing the several Lots in the Townships of Belmont, Methuen, Anstruther, Galway and Cavendish, in the County of Peterborough, and of the Townships of Cardiff, Monmouth, Snowden, Lutterworth and Glanmorgan, in the Provisional County of Haliburton, which have been sold, located, disposed of, or applied for, otherwise than under the "Free Grant and Homestead Act," since the first day of January, 1880; also, the dates of the said sales, the persons to whom sold, the prices paid, and terms of payment; also, the dates of the several applications for the purchase, location, and terms of location of said lots. (*Not printed.*)

(No. 92.)

Return of the names of all persons appointed or employed for the collection of Statistics other than Vital Statistics in connection with any Department of the Provincial Government; the places of residence of such persons, the salary or other remuneration paid or given to them; the dates during which they were employed; the instructions, if any, given to such persons, and a statement shewing the cost of compiling such statistics, such Return to embrace the years 1883 and 1884. (*Not printed.*)

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